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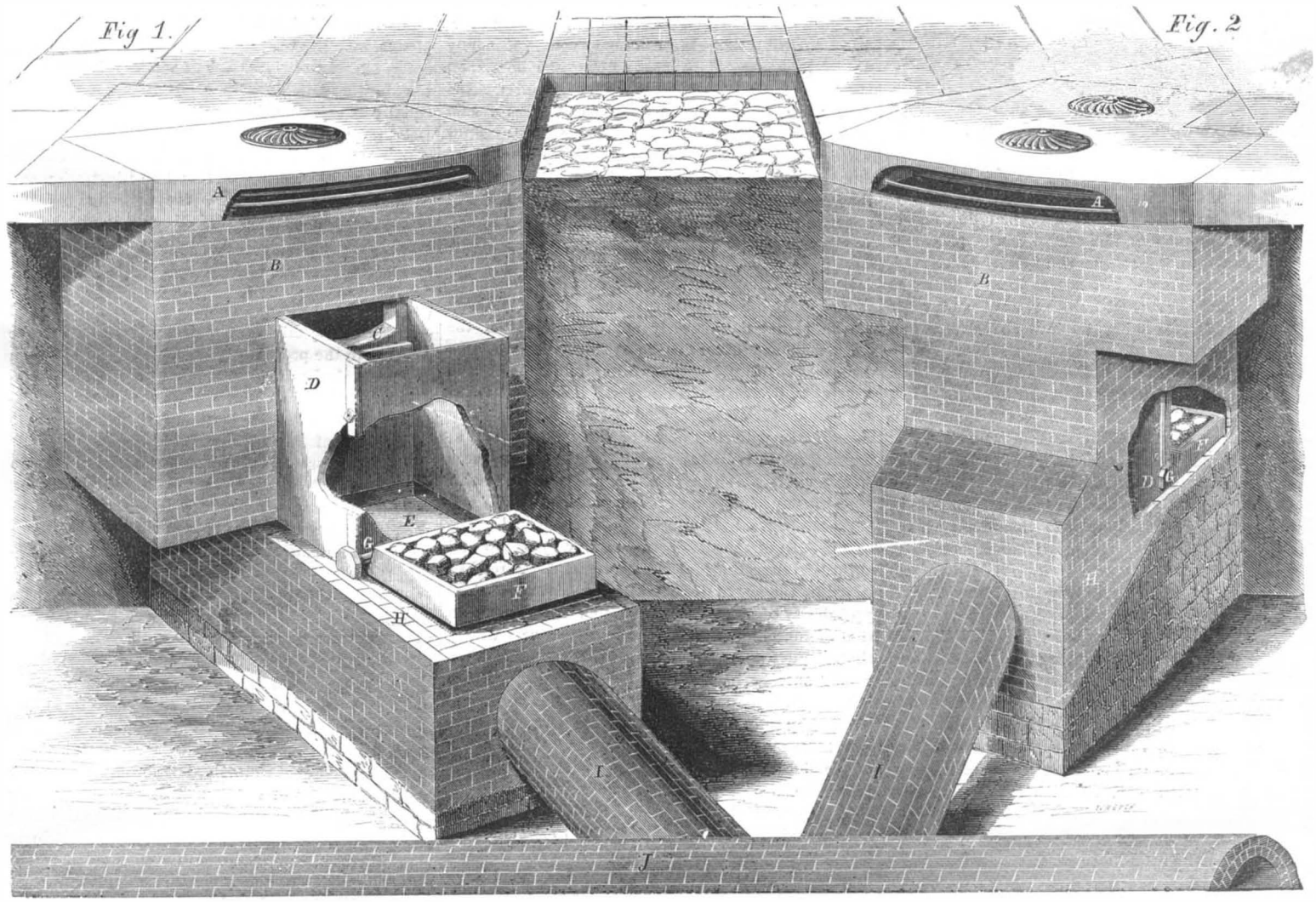
Improved Patent Stench Trap.

The public health in cities is a question of interest to all citizens alike, be they the proprietors of palatial residences or the denizens of hovels. "It has been observed," says Noah Webster, in his work on epidemics, "that pestilence has always been the curse of populous cities. Of about two hundred general plagues recorded in history a few only have been so violent as to spread over countries into villages and farm-houses. Almost all have have been limited to large towns, evidently demonstrating that they would never have effected mankind without the impure air generated in those places." Men of science in London, Paris and other European cities have found by a long series of interesting experiments that the alarming increase of mortality in those cities was the result, mainly, of imperfect drainage and sewerage. Sewer gases are now known to be terribly destructive to human life. It has been, comparatively, within a recent period that scientific and public attention has been turned, in this country, to the health of cities; but investigation has developed startling facts that are enough to alarm the most careless in our business-engrossed community. Statistics show the United States to be the most healthy country in the world, but the city of New York is the most unhealthy city, excepting New Orleans, in America or Europe. There is doubtless no reason, aside from the sewers, why New York should not be the most healthy city in the world, as it is washed on either side by two noble rivers and the Croton has been made to flow through our streets and houses.

Eminent physicians in this country, in accounting for the causes that produced these facts, consider that the respiration of sewer gases, arising from imperfections in our drainage and sewerage, to be the most deleterious and dangerous. Our engraving represents a patent stench trap which prevents any of the evils specified. It shows the intersection of two streets. Exposed to view on either corner (as if by excavation) are the public drains or receiving-basins and culverts, as they are commonly named; the one on the left hand of the engraving (Fig. 1) exhibits a basin and culvert, so altered and improved as to admit of the attachment of the stench trap at the side of the basin. Fig. 2 is a new form of basin and culvert, with the attachment to the bottom of the basin, both arrangements permit the water and street washings to pass into the sewer with facility and prevent the rising of malarious gases and vermin. The essential difference in the operation of the two consists in this—Fig. 1 prevents the filling up of the sewers with large and heavy substances, such as long sticks, cobble-stones, &c., by arresting their passage and retaining them in the basin, therefore this arrangement is peculiarly adapted to places where the descent of the sewer is slight and the flow through it sluggish; Fig. 2 allows every thing to pass, and is adapted to localities where the descent of the sewer is great and the flow through it is consequently rapid.



VOORHEES' PATENT STENCH TRAP.

The patent water-lute may be constructed of cast iron or any kind of metal. Its operation is as follows:—In Fig. 1 the street-wash passes through the opening, A, into the basin, B, thence through the opening, C, into the chamber or water-box, D. In Fig. 2 the street-wash passes through the opening, A, directly into the chamber, filling the chamber to a certain altitude or water-mark (indicated by a dotted line), whereupon the bottom of the chamber or valve, E, opens downward, thereby discharging about two-thirds of the water; the valve then closes, retaining and trapping about one-third of the water in the chamber. The reason of the closing is that the valve, E, being one arm of a lever—the other extremity supports a balance plate of any required weight. In the engraving, instead of a metallic balance plate, it supports a box, F, containing stones. The fulcrum or shaft on which it works fits closely into a groove on the back of the chamber to the depth of a third of the diameter of the shaft. The

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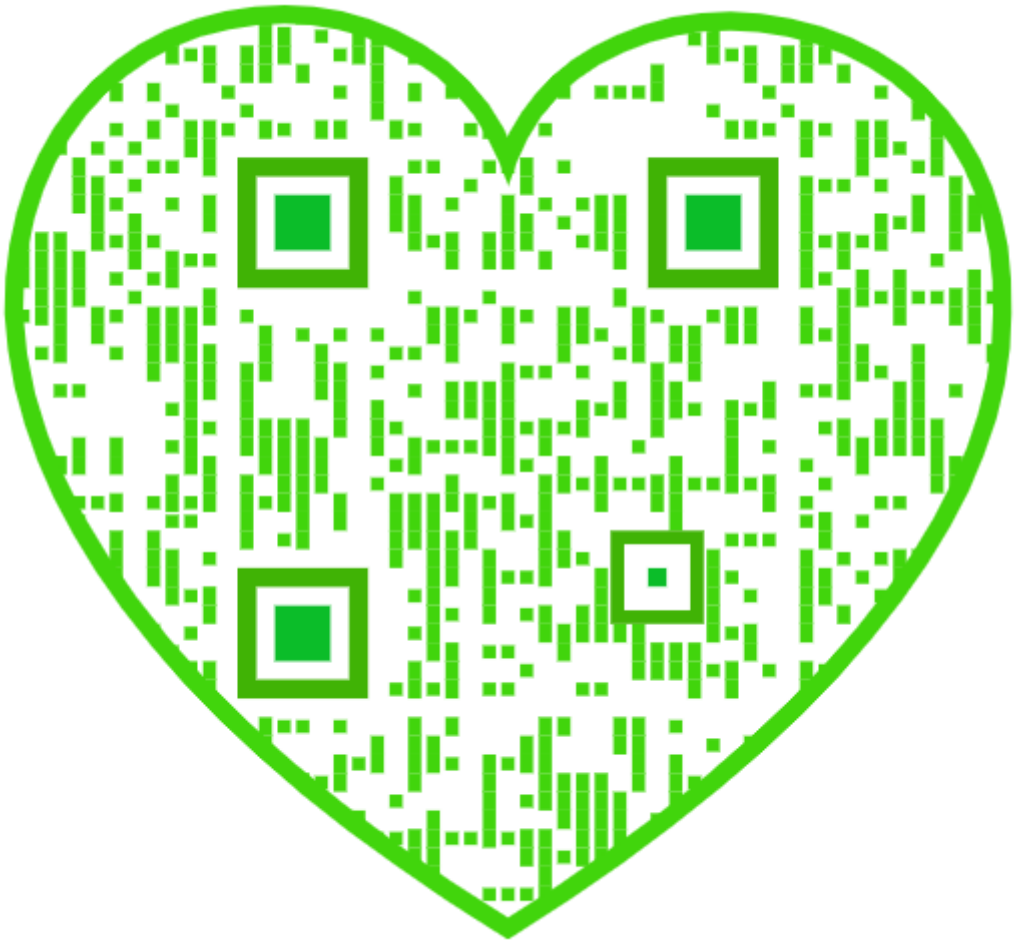

two ends of the shaft play freely on its journals in the ends of the bearings, G, that are secured to the chamber by screws or bolts. The valve, shaft and balance-plate may be cast in one piece. India-rubber is nicely fitted around the edges of the valve and bottom of the chamber at the points of contact, so as to make it absolutely air-tight. If we suppose the weight of the stones on the balance-plate in the box to be 150 pounds, causing the arm of the lever supporting it to gravitate downwards, the waste water when it reaches the water-mark equals the weight of 150 pounds; thus is produced an equipoise or balance of both arms of the lever. When the water rushing in the chamber ascends above the water-mark, the equilibrium is destroyed and the valve opens and discharges about two-thirds of the water, such discharges causing the stone or balance-plate end of the lever to become, in turn, the heavier and to press downward and the valve end of the lever to close, thus trapping a portion of the water. The water so trapped acts as a lute or seal and prevents foul air, sewer gases, &c., from ascending. During heavy rains or showers the valve opens or closes with more or less rapidity, according to the supply, always discharging and trapping the same proportions of water. Should, however, the supply cease and hot weather ensue, dispelling by evaporation the whole or portion of the trapped water, still the valve fitting the chamber air-tight as well as water-tight, effectually precludes the ascension of the gases, &c. The discharged water passes into the culvert, H, and thence through the duct or pipe, I, into the public sewer, J.

A patent has been ordered to issue for this invention through the Scientific American Patent Agency, and it is claimed that it will effect the following objects:—It will prevent the escape of the poisonous sewer gases into the streets through the receiving-basins and culverts and into houses when attached to private drains, sewers and sinks; it also prevents sewer rats from coming up into the streets and houses. When it is attached to the side of a basin (as in Fig. 1) it prevents the filling-up of a basin with large sticks and stones, and that it provides against the overflow at the street corners (so often seen in cities), occasioned by the sediment collecting in, and stopping up, the basin. In low situations near the rivers, when at times the flood tide rises high, it frequently causes the accumulations in the sewers to be forced up into the streets by the back water; this trap renders it an impossibility. Another of its advantages is its non-liability of becoming stopped-up. Should it by any chance become so, a man upon the side-walk, with a long pole thrust through the man-hole, can set it agoing in a few seconds, instead of cleaning it out by the cart-load as is now done in the old ones. The saving effected in the cleaning-out of the basins will amount to thousands of dollars annually. For further information address T. B. Voorhees, 60 Wall street, New York. Models of this invention can be seen by applying to C. W. Baker, 29 Beekman street, New York.

Glycerine in Surgery.

In a communication in the London *Lancet*, by Dr. E. J. Tilt, it is stated that glycerine is now very extensively used in the Paris hospitals—the annual consumption being 3,000 pounds. It is used for skin diseases and for foul wounds. It possesses antiseptic properties and is used pure in lotions and also in ointments mixed with starch. A good ointment is made by boiling 80 grains of starch in 1 fluid ounce of glycerine. This ointment never becomes rancid; it is inodorous and does not change. Corn starch has been found best suited for the purpose. A stiff plaster can also be made with 150 grains of starch boiled in 1 ounce of glycerine. A sedative plaster is made with sulphate of atrophia, 3 grains; veratria, 3 grains; sulphate of morphia, 8 grains; otto of roses, 1 drop; hard glycerine ointment, 1 ounce.

A Milwaukee (Wis.) paper states that the wheat trade of that city, as reported by the Chamber of Commerce, is greater than that of Chicago. The total wheat trade of Milwaukee for 1862 was no less than 17,834,926 bushels. This amount would make it the greatest primary wheat market in the world. Wisconsin wheat is of a very excellent quality.

The Cost of Horses employed upon City Railroads.

The *Ledger* publishes (from the auditor's report of the city of Philadelphia) the following information relative to the cost of horses on the railroads of that city. There are 18 passenger railroads, employing 2,300 horses; the feed, shoeing and harness of these animals cost per annum, the sum of $182,181. In addition to this expense, the cost for stables, &c., amounts to a sum total of $232,204, not including expense for wages for hostlers, and the loss upon the animals that die during the year. Taking this great expense into consideration the *Ledger* advocates the adoption of steam engines for city railroads. It says:—"By the use of dummy engines the railroad companies get rid of the expense of keeping large stables, of the attendance and the expense of keeping from 100 to 300 horses each, the cost of which would double the figures above given. Each car having the motive within itself can be driven, we are told, with a consumption of a couple of bushels of coal per day; giving the liberal allowance of four bushels, and we have a consumption of coal of but a tun a week for each car, or fifty-two tuns a year, which at a cost of $6 per tun, would be $312, annual cost. There are 470 cars in use on all the roads, which, at the above cost to run with steam, would make a total of $136 640 for keeping eighteen roads in working operation, against $232 204, the annual expense of merely feeding, shoeing and harnessing, &c., the horses on the lines of but ten of the railroad companies. Adding the other incidental expenses, it gives a sum probably double the amount. These figures show what would be saved to the public by the use of dummy engines, and how much capital is actually thrown away in using a power more expensive and not nearly so safe and reliable."

The Snows and Seas of Mars.

Mars has lately presented a favorable opportunity for the examination of its surface. The constitution of this planet more nearly approaches that of the earth than any other in the system. Snow can be detected at both poles, the white circle increasing in winter and decreasing in summer. It has been found that the center of this region of snow does not coincide exactly with the poles of the planet. And in this respect it is like the earth, whose greatest cold is not exactly at the pole. A greenish belt with deep bays and inlets near the equator, which is suspected to be a sea, has recently been detected. The termination of the snowy region is very sharp and abrupt, giving the idea of a lofty cliff. A reddish island in the above sea has also been detected. The probability of Mars being inhabited is greater than that of any other planet. Its density is very nearly that of the earth. The heat and light of the sun would only be half of that enjoyed on our globe; but then this may be compensated by an atmosphere which may form a warmer wrapping than ours and by a more sensitive eye. A great part of the surface of the globe is covered with snow for half of the year; the people in Mars would not be worse off than we are in Canada, and life is tolerable here. People emigrating from this planet to Mars would find that they were only half as heavy as they are here, which some would not regard as a disadvantage.—*Leitch.*

Manufacture of a Great Iron Plate.

The London *Times* contains a description of a visit paid by the Lords of the Admiralty to Messrs. Brown's works at Sheffield, England, where the rolled plates for the armor-clad frigates are manufactured. The rollers for making the plates are 32 inches in diameter, 8 feet in width, and are driven by an engine of 400 horse-power. One plate, manufactured on the occasion, was 19 feet long, 4 feet wide, 12 inches in thickness, and weighed 20 tuns—the largest ever fabricated. Several other plates of lesser size were made; one was 17 feet long, 4 feet broad, and 5½ inches in thickness. Bessemer steel was also manufactured in the presence of those naval dignitaries. In twenty minutes from the time of putting the charge of cast iron into the furnace, it was poured out into the mold as tough steel, and formed an ingot weighing three tuns. The manufacture of steel from cast-iron, by what is called "the Bessemer process," is now practiced very generally in all the large European iron-works; that kind of steel is beginning to be used extensively in making rails.

THE WHITWORTH PROJECTILE.

We frequently have occasion to refer to the adoption in foreign countries of American inventions, either in principle or in detail. The Whitworth projectile, now so famous, which, it is said, inflicted the principal damage to our *Monitors* and iron-clads in the late attack on Charleston, if not exactly a case in point, illustrates the often-noted fact, that inventors, though widely separated, often catch the same inspiration.

On page 165, current volume of the Scientific American, will be found an illustration and description of this projectile. It will be remembered that it is hexagonal in its section and mechanically fitted to the bore of the gun, which is also hexagonal in its section. The angles or corners made by the junction of the sides of the hexagons, are the equivalent of spiral grooves in the gun, and of projections or flanges on the projectiles themselves, which give the rotary motion to the latter. This plan differs radically from those of Armstrong (which seems to have been abandoned) and others, which depend upon forcing or expanding soft metal into the grooves to give the desired rotation. Capt. Dalghren, in his late report to the Secretary of the Navy, says that no little trouble has been experienced in the stripping of soft metal. Whitworth apprehended this difficulty, and has obviated it by his plan; but whether the future will develop difficulties attending it equally as objectionable as that mentioned by Capt. Dalghren remains to be seen.

By reference to the Scientific American of July 6, 1861, page 5, there will be found an illustration and description of a projectile, the invention of Mr. Sigourney, of Watertown, N. Y., and it will be observed that the leading features of it are precisely similar to that of Mr. Whitworth's, although it is evident that Sigourney's plan, of both gun and projectile, is much the simpler and cheapest. Both depend upon fixed projections, or their equivalents, to give rotation to the projectile (the first requisite); both are mechanically fitted to the bore and grooves, requiring special machinery for the purpose, and neither of these inventors employ soft metal to secure the rotation of the shot.

We do not propose to discuss the merits of the two inventions, as compared with each other, with all the various constructions and exterior configurations of which both are capable, or as compared with others constructed upon entirely different principles. We will, however, venture an opinion upon the operation of the Whitworth projectile, when fired from a muzzle-loader, with which we observe he has lately been experimenting; the practical difficulties attending the use of breech loaders having led him to this; but we do not know whether he used the same projectiles we have described, and gave them the necessary windage, or what results he obtained. Now, the Whitworth projectiles, for breech-loaders, may fit the bore very closely, but for muzzle-loaders a certain amount of windage must be allowed. This being nearly one-sixteenth of an inch, the axis of the projectile and bore will, of course, be eccentric to each other. When the projectile passes out of the gun, the angles of the projectile, only, that are in contact with the angles of the bore, will have a bearing and receive the impulse of rotation. It would seem, therefore, that the result would be a one-sided impulsion, alike destructive of the proper rotation, regularity and accuracy of flight.

The chief value of rifled guns lies in their ability to project an elongated missile with great force and accuracy to a long distance; and, if our criticisms have any weight, the Whitworth gun is equalled, if not excelled, by many guns of home production that depart widely from the features observed by Mr. Whitworth.

The shell that destroyed the *Queen of the West* was fired from the distance of a mile and a quarter. It was one of those lucky hits which sometimes happen in war, and which show how destructive a thing firing could be made if it was well made.

The head gunner on the pirate *Alabama* is one of the most accomplished artillerists that was ever in the British navy. He was paid off and got his discharge a few weeks before the *Alabama* sailed.

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The Earth-worm.

The earth-worm lives a very solitary life below ground, driving its little tunnels in all directions, and never seeing its friends except at night, when it comes cautiously to the surface and searches for company. In the evening, if the observer be furnished with a "bull's-eye" lantern, and will examine the ground with a very gentle and cautious step, he will be sure to find many worms stretching themselves out of their holes, retaining for the most part their hold of the place of repose by a ring or two left in the hole, and elongating themselves to an almost incredible extent. If, while thus employed, an earth-worm be alarmed or touched, it springs back into its hole, as if it had been a string of india-rubber that had been stretched and was suddenly released. The worms have a curious habit of searching for various leaves and dragging them into their holes, the point downwards, and are always careful to select those particular leaves which they best like. As a general rule, they dislike evergreens; and the leaf which I have found to be most in favor is that of the primrose. I have often watched the worms engaged in this curious pursuit; and in the dusk of the evening it has a very strange effect to see a leaf moving over the ground as if by magic, the dull reddish brown of the worm being quite invisible in the imperfect light. The food of the earth-worm is wholly of a vegetable nature, and consists of the roots of various plants, of leaves, and decayed vegetable substances. Many persons cherish a rooted fear of the earth-worm, fancying that it lives in church-yards and feeds upon the dead. These fears are but idle prejudice, for the worm cares no more for the coffined dead than does the tiger for the full manger, or the fox for the bleeding gazelle. The corpse, when once laid in the ground, sinks into its dust by natural corruption, untouched by the imagined devourer. The so-called worms that feed upon decaying animal substances are the larvæ of various flies and beetles, which are hatched from eggs laid by the parent; so that if the maternal insect be excluded, there cannot be any possibility of the larvæ. Moreover, neither the fly nor the beetle could live at the depth in which a coffin is deposited in the earth; and if perchance one or two should happen to fall into the grave, they would be dead in half an hour, from the deprivation of air and the weight of the superincumbent soil. Let, therefore, the poor earth-worm be freed from causeless reproach; and though its form be not attractive, nor its touch agreeable, let it, at all events, be divested of the terrors with which it has hitherto been clothed.—*Routledge's Illustrated Natural History.*

Curious and Costly Books.

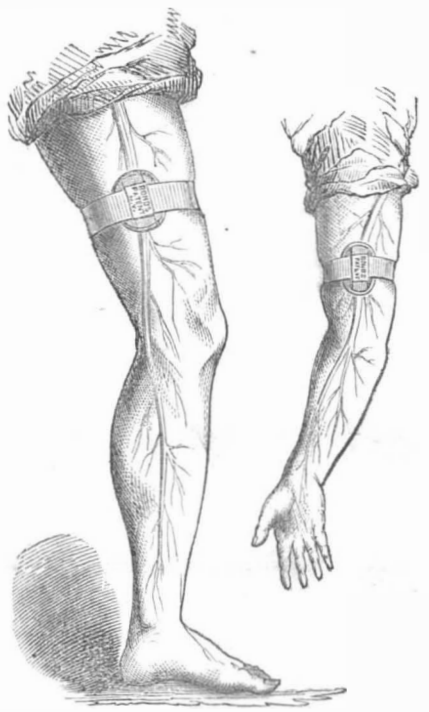
In the year 1572, a splendid production—the "Spanish Polyglot,"—was published, printed by Christopher Plantin. A most magnificent copy upon vellum, in the original binding, was sold in London, some twenty-five years since, for 1,000 guineas, and enormous as was this price, the copy was actually wanting three out of the ten volumes—those being in the Bibliotheque Royale. One of the scarcest books in the language—for there are, according to Dibdin, but two known copies extant—is a little black-letter tome of 1586, entitled "A Discourse of Englishe Poetrie," &c., one of which was sold in the Duke of Roxburgh's collection for £64. We might amuse the reader by citing a few of the quaint and alliterative titles of some of the books of those times. Take the following for instance:—"A Footpath to Felicitie," "Guide to Godliness," "Swarme of Bees," "Plante of Pleasure and Grove of Graces." (1586.) These were most rife in the days of Cromwell. There were many bordering closely on the ludicrous, such as the one styled, "A Pair of Bellows to blow off the Dust cast upon John Fry;" and a Quaker whose outward man the powers thought proper to imprison, published "A Sigh of Sorrow for the Sinners of Zion, breathed out of a Hole in the Wall of an Earthen Vessel, known among Men by the name of Samuel Fish." We might multiply the numbers *ad libitum;* but must content ourselves with adding one or two more. "A Reaping Hook well-tempered for the stubborn Ears of the Coming Crop, or Biscuits baked in the Oven of Charity, carefully conserved for the Chickens of the Church, the Sparrows of the Spirit and the Sweet Swallows of Salvation." To another we have the following copious description:—"Seven Sobs of a Sorrowful Soul for Sin or the Seven Penitential Psalms of the Princely Prophet David, whereunto are also annexed William Humuis's Handful of Honeysuckles, and divers Godly and Pithy Ditties, now newly augmented."

The "Mazarin Bible," so called on account of its having been found in Cardinal Mazarin's library, is considered to be the very first book printed with metal types. The first Bible, of 1462, is an edition which exhibits a matchless effort in the art of printing.

A few years ago a typographical wonder was exhibited in London, being a sumptuous edition of the New Testament, printed in gold on porcelain paper of most immaculate beauty, and, for the first time, on both sides. Only one hundred copies were taken off.

BOND'S IMPROVED TOURNIQUET.

Very many accidents occur from hemorrhage where surgeons are not within call, and in such cases where the bleeding is violent and dangerous, some provision must be made to check it or the sufferer will die from what appears, and really is, in the absence of



medical aid, an insignificant matter. Especially at the present time, while the war is raging, are such incidents common, and it is gratifying to know that at a small expenditure all such catastrophes can be avoided. Our engraving is a representation of an improved tourniquet which, by compressing the vein through which the blood flows, at once stops the issue. It is merely a leather pad provided with an elastic strap which is slipped over the wounded limb and, in connection with the pad, thoroughly accomplishes the end in view. The engraving very fully explains itself and renders further comment unnecessary. The main points about it are that it is so extremely light and portable that it can be carried in the vest pocket, that it is so simple in its construction that it can be afforded at a low price, and lastly and most important of all, that it arrests the flow of blood and prevents that loss of life which would otherwise ensue. A number of eminent surgeons in this city have given this tourniquet their unqualified approval. No soldier should be without one, and friends could not do their absent ones a better service than by sending one of these appliances. Application for a patent is now pending. Further information can be obtained by addressing the inventor, F. W. Bond, 39 Nassau street, New York.

California Flax.—The editor of the Los Angelos *News* has been furnished by Dr. Osborn, of that place, with a parcel of native flax, which grows wild and is said to be abundant in that section. The *News* says it is from a stock which appears to be a species of nettle; in texture there appears to be no material difference between it and common flax. It is thought that this plant might be successfully cultivated. The fiber is quite as fine and strong as a cultivated article of real flax.

VALUABLE RECEIPTS.

To Remove Stains of Indelible Ink.—The nitrate of silver forms the basis of indelible ink. Linen is sometimes stained with it, and it cannot be removed by washing with soap. Such stains can be removed with a solution of the cyanide of potassium, especially if the stain is fresh, but if it is old the best way of erasing them is by the application first of the following mixture:—Spirits of wine 1 ounce, iodine 20 grains, nitric acid 20 drops, hydrochloric acid 20 drops. It is applied with a camel's hair pencil, when the dark stain will become yellow; after this apply a solution of the hyposulphite of soda, or one of the cyanide of potassium, and the stain will quickly disappear. The linen should then be washed in soft water. Stains of nitrate of silver may be removed from paper by the same method.

Care of Harness.—T. Oliver Ayres, a practical harness-maker, Kent county, Del., contributes to the *American Agriculturist* the following suggestions:—"Harness should be kept hung up on wooden pegs in a clean dry room with a plank floor, so that it may be free from dampness. When soiled, it should be washed with Castile soap suds. Harness that is in constant use needs oiling four times a year; if only occasionally brought out, as carriage harness, &c., twice a year will be sufficient, if the washing be not neglected. To oil harness, separate all the pieces, and lay them in water until thoroughly wet through. Then wash them clean and allow them to dry sufficiently. To know when they are in a good condition for oiling, bend a strap, and if the water does not ooze out it is dry enough. Train oil (whale oil) is sometimes used, but neats-foot oil is much better. Mix with it a little lamp-black, and with a brush apply it to both sides of the straps. About six hours after oiling, wash the whole with Castile soap and warm water, let them dry, rub well with a woolen cloth and buckle them together."

Whale and most vegetable oils injure leather. Neats-foot oil, with the addition of one ounce of beeswax to the pint of oil, is the best mixture that can be used for harness. Soap suds should only be used with a sponge to wipe off the dirt; the leather must not be soaked with the suds. A good method of keeping harness in good condition and appearance, is to blacken and polish it exactly like shoe leather, then apply the mixture of neats-foot oil and beeswax.

Alloys of Platinum.—Iron and platinum in equal parts form a crystalline alloy. Platinum dissolves in fused zinc, forming a bluish white hard alloy. Equal weights of nickel and platinum form a yellow alloy; and an alloy resembling gold in color is made of 9 parts of platinum; 16 of copper, and 1 of zinc. Lead, antimony, arsenic, gold and silver form alloys with platinum. When tin-foil and platinum are wrapped together and heated by the blow-pipe, they combine with incandescence, and zinc heated in platinum foil, before the blow-pipe, burns vividly with a slight explosion.

Cleaning Glass.—Mix some fine whitening in a little dilute alcohol, and smear it upon the glass with a soft rag, after which rub off with chamois leather. Looking-glasses may thus be cleaned, and fly specks, &c., removed.

Zincing Iron.—Iron to be coated with zinc is first scoured with sand in warm dilute muriatic or sulphuric acid, washed and dried. After this it is run through a bath of melted zinc, the surface of which is covered with sal-ammoniac. If the iron is covered after being scoured, with a strong solution of the common salts of tin, and dried before being dipt into the zinc, a beautiful wavy surface of zinc is obtained. Zinced iron should be nailed with zinced tacks.

To Protect Animals against Flies and Insects.—Walnut leaves, 4 ounces; lobelia leaves, 4 ounces; boiling water, 1 gallon. Let the mixture stand until cool; then express the fluid through cotton cloth, and add 4 ounces of the tincture of aloes. Apply a small quantity of this compound, daily, to the surface of the body, by means of a sponge.

Remedy for Bites and Stings.—Plantain leaves (*plantago major*), 4 ounces; lobelia leaves, 2 ounces; boiling water, 1 quart. When the mixture becomes cool, bind a quantity of the herb on the affected part, and give the animal, as a drench, four or five ounces of the remaining fluid, every four hours.

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Improved Hand Truck.

In taking goods on board of steamboats or discharging the same, the wharf is much of the time either higher or lower than the deck of the vessels, and the gang-plank has to be inclined accordingly, making it very difficult, when a heavy load is upon the truck, for the workman to hold it back. It not unfrequently requires two or three persons to hold the truck when descending the plank with a heavy load. To enable the workman to control the truck easily, even when loaded heavily, the brake here illustrated has been designed, which presses upon the wheel when required and readily retards its progress. It is equally applicable to trucks used for warehousing purposes. The annexed engraving illustrates the manner of applying the brake. It is double-acting, thereby having the same effect upon the wheel, whether the truck is drawn or pushed ahead of the operator. It consists of the lever, *a*, fastened to the truck frame. This lever has two pins, *b*, one above and the other below the fulcrum which work in the slots on the cresent-shaped prolongation of the brake, *c*. There is also a spring at *d* which assists in throwing the brake-block into contact with the wheel. The apparatus is worked by the rod, *e*, on the side, the end of which may be grasped by the laborer, and operated as circumstances may require. The engraving renders the invention perfectly intelligible without further comment.

The inventor, Mr. C. L. Daboll, has disposed of the right of the patent for the city and State of New York to Mr. John Roach, of the Etna Iron Works, No. 100 Goerck street, New York, where trucks may be seen with the brake applied, and where further information may be had.

Letters relating to the invention addressed to the inventor at New London, Conn., will also receive prompt attention.

DABOLL'S BRAKE FOR HAND TRUCKS.

French Engines.

For a long period the French people were chiefly distinguished as mechanics for constructing fine small machinery, such as clocks, &c., and it was thought by many persons that they had not the capacity for constructing large machines, such as steam engines. Of late years, however, they have shown equal ability with Americans and Englishmen in constructing locomotives. In Paris there are large establishments in which engines are turned out which vie with those of any other country. Twenty new locomotives are now being constructed in Paris for a railway in Spain, and twelve have recently been built for a Russian railway.

Eating Habits.

The most common way to a premature grave and one of the shortest cuts to that destination is down a man's throat. There is a multitude which no man can number, daily eating immoderately, thus sapping the constitution and laying the foundation for innumerable ills and a too early grave. The wise man does it, and the fool; the virtuous and the abandoned; the kind and the cross, of all climes, are among the errorists. But there are some who are wise as to this point, and the number is increasing; the number of those who are men and women of force; who think for themselves, observe for themselves; who have vigor of intellect enough to compare causes and effects, antecedents and consequents. There is constantly coming to us the knowledge of mothers, who, by the teachings of this *Journal*, have been led to regulate their households rationally, and are reaping a rich reward in the shape of health for themselves, and what is dearer still, increasing health for their children.

The first point in the philosophy of eating is to perform that very necessary business with the greatest regularity. A young Scotch trapper, Thomas Glendy, told us thirty years ago, that the Indians, with whom he had been hunting, ate but once a day, and that was in the early evening; that then, a single invidual would consume several pounds of meat, smoke his pipe, lie down to sleep, get up by the dawn, hunt all day, eating nothing until the night again. An old beau of Washington city took it into his head that eating was a trouble, and that he would perform that process but once a day. On occasions of his being invited out in the evening, he felt compelled to take something, although he had eaten his regular dinner; but then he would eat nothing at all next day. These irregularities were very rare; he died when nearly eighty years of age, a sprightly and gallant old beau to the last. On the other hand, persons who are regularly irregular seem to live a good while. Captain Hall lately stated to the Historical Society, in this city, the case of some Esquimaux, who, being carried to sea on a cake of ice, ate absolutely nothing for the space of thirty days, when each man swallowed about thirty pounds of meat and oil, and neither bursted up nor died. But observation has shown that, both as to man and beast, regularity in the hours of eating is indispensable to a healthful, thriving condition. Most articles of food require several hours to be placed in a condition to be passed out of the stomach; and if a new supply of food is introduced before this process of digestion, of conversion, is completed, the former food is not passed out until the latter has been brought to its own condition; the result or its being kept warm so long is, that it begins to decay, gas is generated, and the whole mass is corrupted. Those who eat often, who eat between meals, always have wind on the stomach and other places; but if it cannot escape, it causes a feeling of weight or oppression, and this is dyspepsia, that horrid hag which has a thousand ails in her train. Half "the girls" have dyspepsia before they are seventeen, in consequence of their everlasting nibbling at every thing eatable in the house. The most natural and healthful times for eating would seem to be at daylight, noon and sundown; the last meal being very light indeed. —*Hall's Journal of Health.*

Changing Clothing.

It has come within the observation of many a reader that serious and severe illness has been induced, and even fatal sickness caused, by a change of clothing. Injury never comes, perhaps, by putting on more or warmer clothing, but by diminishing the amount inconsiderately. The first great general rule, and always the safest, is to make the change when you first dress in the morning; if you wait until you are uncomfortably warm during the day, it is most likely to be in the early part of the afternoon. In making the change, then, there are two or three causes of disease in operation; the fact of undressing endangers a check of perspiration; the garments about to be put on may not be perfectly dry, there may be no opportunity, even if they are dry, to warm them up to the heat of the body; and further, just about the time you have changed, the cool and damps of the afternoon and evening begin to come on, increasing until dark, while having been thrown off your guard by the warmth of the morning, you may not feel the necessity of a fire, and by tea-time you are surprised with a disagreeable chilliness running over you; then the cold has been taken, to settle in the eyes, causing weakness and watering; or in the throat, creating a raw or burning sensation at the little hollow at the bottom of the neck and top of the breast-bone; or on the covering of the lungs, to give the painful pleurisy; or in the lungs themselves, in the shape of a troublesome bronchitis or a dangerous pneumonia; or in the bowels, causing weakening diarrhea; or on the covering of the bowels, inducing peritoneal inflammation, to end probably in death in few days.

It is very unsafe to lessen the amount of clothing sooner than the first of May, and then not in quality, but in less thickness of the same material; from yarn socks to worsted; from a thick, knitted flannel shirt to one of common woolen flannel; then about the first of June, to a gauze flannel; if this is oppressive to some, then employ canton flannel. But it is certainly a great mistake for any body to wear any thing else next the skin, even in the hottest summer weather, than woolen flannel. Silk shirts next the skin cannot be advocated on any tangible grounds; the moment a man begins to twaddle with you about "electrical influences," turn your heel upon him and set him down as a presumptive and impudent ignoramus.—*Hall's Journal of Health.*

MANUFACTURE OF PLATE GLASS.—The Lenox (Mass.) Plate-glass Works is the only manufactory of the kind in the country. The works were destroyed by fire in the summer of 1862, but were speedily re-built and in full operation again in November. What is known as "rough-plate glass," used for sky-lights, floors, &c., is manufactured here. There are used at the establishment, per month, 60 tuns of sand, 300 cords of wood and 300 bushels of lime, and there are made about 5,280 feet of glass each week, averaging one half inch in thickness. All the materials for the glass are found in the neighborhood.

UP to the 13th of last April no less than 7,402,339 gallons of petroleum had been shipped from New York to foreign ports. London and Liverpool are the two great receiving ports of American petroleum —over 1,000,000 of gallons having been sent to each of these places at the date stated. In addition to the above, 3,353,608 gallons have been shipped from Portland, Boston, Philadelphia and Baltimore, making a total of 10,755,947 gallons. Our petroleum trade with foreign nations has already attained to gigantic proportions.

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Improved Patent Window-sash Stop.

Nearly every traveler or tourist, when passing through a country unfamiliar to him, naturally desires to observe its general features and impress their character upon his memory. So all lovers of nature, even though the very rocks, streams and hillsides are as familiar to them as their own homesteads, yet experience delight on beholding the beauties which nature spreads before them. These pleasures are often interfered with by the miserable, shackling annoyances in the shape of fastenings on the car windows, which will neither keep the window or blind up nor down, so that the latter is continually falling and obstructing the view and also preventing the free ventilation of the car. All these disagreeable things are remedied by the adoption of the window-sash stop herewith illustrated. It consists of the metallic shoe, A, provided with a spiral spring, *a*, slipped over the stem on the shoe itself. This shoe slides in a groove, B, worked in the window rail, and moves up and down with the sash. The spring throws the shoe into forcible contact with the wood and effectually keeps the sash at any desired point. The sash works so easy, withal, that any lady may raise it as she desires. Fig. 2 is an end view of the shoe, and Fig. 3 an elevation of the shoe removed. The blind-sash is provided with the same attachments and works similarly in every situation, and will be found extremely useful. This arrangement can be applied to all windows. This invention was patented on Nov. 5, 1861, by B. G. Hildreth, and further information may be obtained by addressing him at the corner of Twenty-first and Hamilton streets, Philadelphia, Pa.

Fig. 1.

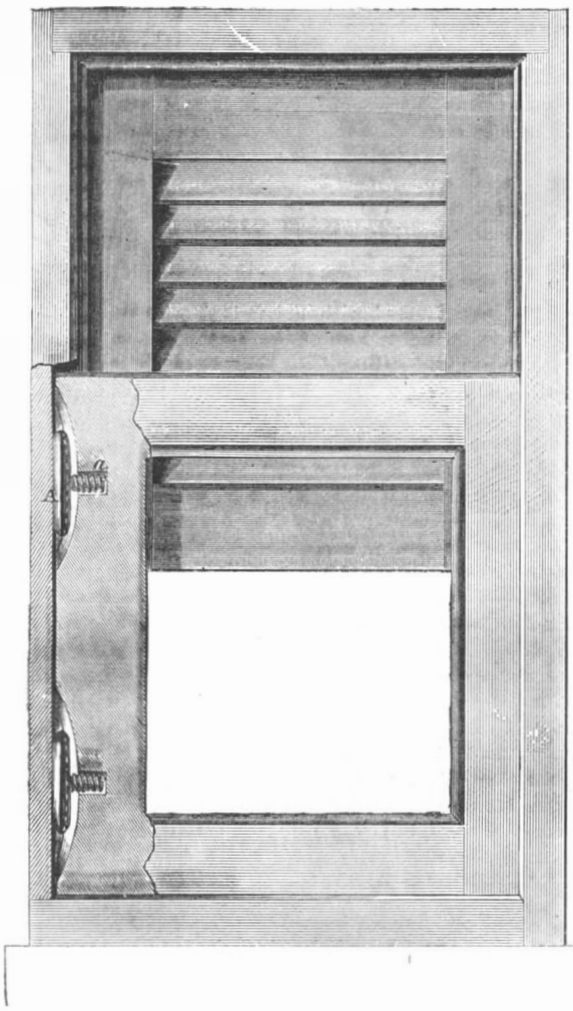


Fig. 2

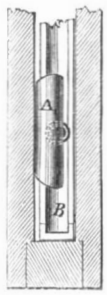
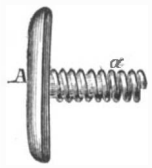


Fig. 3.



HILDRETH'S PATENT WINDOW-SASH STOP.

Discoveries in Gas Illumination.

Improvements in artificial illumination are like beacons set on the highways of civilization. The following extracts are taken from a lecture lately delivered by E. Frankland, F.R.S., before the Royal Institution of London, and copied from the London *Journal of Gas Lighting*:—

"One improvement lately made in purifying gas is the invention of the Rev. Mr. Bowditch, of Wakefield, England, the object of which is the removal of sulphur. All gas that is purified in the common way contains certain quantities of sulphur in the form of bisulphide of carbon, and probably also in that of sulphur-organic compounds. The gas may be passed in the usual manner over lime or the peroxide of iron; but, this operation does not, in the slightest degree, affect the sulphur compounds in question. During the combustion of the gas, however, the sulphur is converted into sulphurous acid, which diffuses itself in the apartment in which it is burned, and a great deal of the discomfort of which many complain in the use of gas is due to this cause. Mr. Bowditch discovered that though cold hydrate of lime will not remove these impurities, they are, to a great extent, got rid of by heating the hydrate of lime to a temperature varying from the boiling point of water up to 400° or 500° Fah.; a temperature of 400° being probably the most convenient for the development of the effects of his process. This process has been found by repeated experiments to remove all but about 2 or 3 grains of sulphur per 100 cubic feet of gas, the quantity of sulphur originally contained in the gas varying from 5 or 6 grains up to as much as 40 or 50 grains per 100 feet.

"Another new fact in connection with gas requires to be noticed, in passing, and that is the discovery of a new illuminating constituent in coal gas, recently made by M. Berthelot. This illuminating agent is a gaseous substance, called acetylene, which is produced under very peculiar circumstances. Unlike all other hydro-carbons with which we were formerly acquainted, an intense heat is favorable to the production of this body, and Dr. Odling has recently demonstrated that two of the constituents of coal gas, light carbureted hydrogen and carbonic oxide, which are useless for lighting purposes, may, by means of the strong ignition of the two gases, be made to form this acetylene, and thus become luminiferous agents. This quite revolutionizes our ideas of the manufacture of gas. We have generally considered it important to preserve a moderate degree of heat in gas-making in order to prevent the destruction of the other luminiferous agents; but the discovery of the formation of acetylene will render it necessary to investigate how far the production of this substance can be carried on upon a large scale and rendered valuable for increasing the illuminating power of gas. The subject is yet in embryo; but it has an important bearing upon the future progress of gas-lighting. By passing gas through an ammoniacal solution of sub-chloride of copper, we have a red precipitate formed, which is a compound of this acetylene with copper. By adding some dilute hydro-chloric acid there is a considerable evolution of gas, which burns with a most intensely luminous flame. Acetylene and olefiant gas contain in equal volumes the same amount of carbon, but the former contains only half as much hydrogen as the latter; consequently, the illuminating power of acetylene is probably at least double that of olefiant gas.

"The compound of acetylene with copper is a body which is readily decomposed with explosion both by heat and friction as well as by percussion. When it attains a certain heat it explodes with considerable violence, and the same effect may be produced by friction. It has been demonstrated recently that this acetylide of copper can be produced by the passage of ordinary coal-gas, containing, as it does, a trace of ammonia, through copper or brass tubes; and explosions which have taken place through cleaning out such tubes, resulting in serious injury to workmen, have been doubtless due to the presence of this acetylide of copper."

The Cleveland (Ohio) *Wool Grower and Manufacturer* tates that the clip of wool in Ohio this season will e 20,000,000 lbs., bring[a] ig 50 to 60 cents per pound

American Steamers in China.

The lucrative nature of trade in Chinese waters has induced a large number of our merchants to fit out steamships for that portion of the globe, and at this date some of the very finest vessels that ever left our ship-yards, propelled by the most economical and powerful engines our machine-shops are capable of producing, are now running there. These vessels generally entirely outstrip the English steamers in speed and far surpass them in economical working. We have received a letter from China, written by an engineer well-known in this city; and the following extracts contain items of information (relative to the practical operations of the steamers) which will be found interesting to the mercantile community:—

"The *Kiangse* is doing first-rate and making lots of money; on our last voyage, which took about thirteen days, we grossed $20,000. The *Hu-Quang* is still on shore, and they will not be able to get her off before next high water, in April ensuing. The water has fallen 38 feet, so you can judgewhat a strong current we have to contend with—about six knots per hour. The *Fire Cracker* is also doing first-rate; she carries an immense cargo; on her last passage from Han-Kow she brought down 1,680 tuns, but it has made her very crooked. Captain W. Johnson will shortly leave here for New York (by the vessel which carries this letter) to build another boat. Bob Robinson leaves for home in about a month, and I understand John Thomas takes his place. . . . . About one-eighth of the foreign population of Shanghai died last summer; it was the most sickly summer they have ever had in China. Capt. Dearborn's boat (the one that Colyer is building) is only now in frame; she arrived six weeks ago, and it will take ten months to finish her. . . . . The *Sunshe* has not arrived yet." [This letter was dated January 22, 1863.]

The *Kiangse* is fitted with H. Winter's rotary cut-off, and the engineer declares that he would not remove it for any other he knows of. Capt. W. Johnson, who took the *Fire Cracker* out to China, has arrived safely in New York, and is about consummating a contract for building a vessel of nearly double the tunnage of the *Fire Cracker*.

Old-fashioned Honesty.—A gentleman states that, when a boy, he was one day in the office of his grandfather, who held a position under the Federal Government, and wishing to write, he was about taking a sheet of letter-paper from the desk. "What are you about there?" said the old gentleman. "Getting a sheet of paper," said the boy. "Put it back, sir, put it back!" exclaimed the strictly honest official, "that paper belongs to the Government of the United States!"

[It would be truly refreshing to be able to record such an instance as the above at the present time. —Eds.

Some ingenious German has invented a paper cup which will completely hold a draught of the hottest liquid, and can be bought for a *pfenning*. By means of this invention the good people of Berlin take up and drink at their ease, as they go along the railroad, the cups of coffee which the comfort-loving Englishmen find it impossible to swallow without scalding their throats.

A transport vessel on a new plan has just been completed at Cherbourg, France. Thirty-six others are nearly finished on the same plan, and they are to be increased to fifty. Each vessel is capable of accommodating 1,000 men, so that, in case of necessity the flotilla at Cherbourg might transport an army of 50,000 men.

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Correspondence

"The Science of Aerostation."

MESSRS. EDITORS :—If Mr. La Mountain, before criticizing Mr. Shaw's aerostatic contrivance, as he has done on page 246, current volume of the SCIENTIFIC AMERICAN, had given a little more patient and elaborate study to the structure of that machine, he would not have fallen into some errors. With regard to trimming and tacking in a balloon with an ordinary car, any attempt to turn the balloon by any gearing like that in question, would indeed have been like attempting, "while sitting in an arm-chair, by taking hold of the rounds, to lift one's self off the floor." But listen to Mr. Shaw :—"The balloon itself moves, while the car is kept stationary by the action of the propeller on the atmosphere." This propeller performs the same office in the balloon as the center board or keel in a ship, namely, presents a resisting force and keeps it from drifting, while the wind bears away the sails and imparts motion to the ship." This circumstance Mr. La Mountain entirely overlooks. Again, it is very easy to demonstrate, mathematically, that in all solids, as you increase the linear dimensions, the surfaces increase as the squares, and the solid contents as the cubes, of those dimensions. The calculations of the writer, in the fourth paragraph, with regard to the spherical form of the balloon, are perfectly correct, and are based upon the foregoing principle. But as to the flattened sphere, he (in substance) says that however greatly you increase the diameter above twenty feet, the balloon will not more than lift itself. "You will gain nothing." This is inferring that in the case of the flattened sphere, the contents increase equally with the surface or as the squares of the diameter, which is not true, as in all solids they increase as the cubes of the linear dimensions.

SETH C. CHANDLER, JR.

Boston, Mass., April 30, 1863.

MESSRS. EDITORS :—The communication from Mr. John La Mountain, aeronaut, which was published on page 246, current volume of the SCIENTIFIC AMERICAN, has, no doubt, furnished much incorrect information to many who have not the advantage for observing differently. Although his reasons appear sound, and are probably correct as to the impracticability of trimming and tacking the flying machine he speaks of, in the atmosphere; yet, while he notices Mr Shaw, the inventor, as "very much like a man who has no practical ideas on the subject whatever," referring to his idea of condensed gas as a motive power, he exposes his own deficiency. As it relates to the strength of boilers in sustaining a pressure of steam, your correction of his statement is in accordance with the experience of many engine builders, &c. Many stationary engine boilers are now worked to a pressure of 600 lbs. per square inch. As to the difficulty of condensing gas, I think he has something to learn that would be novel to him, and would suggest that he rest a while from his "patient and elaborate" study of the subject, and make a few observations on "mother earth," and perhaps he will stumble on something that will serve some of his purposes hereafter. The passenger cars of many of our railroads are lighted with gas, which is, of course, carried with the car, in a condensed state. It is forced into iron cylinders until the pressure reaches 340 lbs. per square inch. The thickness of iron is but $\frac{1}{8}$ of an inch, only $\frac{1}{3}$ as thick as that in a locomotive boiler. The apparatus for condensing it is very simple, and consumes but very little power. I have taken a great interest in the science of aerostation, and, although not an aeronaut, beg leave to differ with some of that profession, on some points, and I think that ballooning is but as the old stage coach when compared with the steam car. J. A. M.

Reading, Pa., April 27, 1863.

[Our correspondent asserts that there are boilers driving stationary engines which are worked at 600 lbs. pressure per square inch. This is a very broad statement, and should be supported with the citation of cases. We are not aware of a single case of a boiler being worked at such a pressure. Mr. Shaw's balloon seems to have attracted a great deal of attention from mechanics, and provoked criticisms which will doubtless be taken by him as kindly as they are intended. The mechanical arrangement of the machine has been questioned by Mr. La Mountain in regard to preserving the ovality of the sphere; that this is very readily obtained by the insertion of stays internally will be apparent to all. That the other features mentioned by correspondents, as, for instance, the action of the propeller on the air, and that of the gearing, are liable to criticism, is not to be denied; but we must avow our skepticism as regards the statement that the cylinders containing gas for burning in cars are only $\frac{1}{8}$th of an inch thick, and are charged at a pressure of 340 lbs. per square inch. The locomotive drawing those cars has a cylinder boiler from 38 to 40 inches in diameter, and from $\frac{5}{16}$ths to $\frac{3}{8}$ths of an inch thick, and is strongly braced and stayed to carry a working pressure of even 200 lbs. to the square inch. If the diameter of the gas-containing cylinders is at all in comparison with that of the boiler, how are we to reconcile the fact of $\frac{1}{8}$th of an inch of iron sustaining a pressure of nearly one-half greater than that borne by $\frac{3}{8}$ths of an inch? Is our correspondent willing to apply a pressure of 340 lbs. per square inch to any locomotive in his knowledge, and stand by to superintend the operation?—EDS.

Operations on the Blockade.

We have been favored with the following letter from an officer on the blockade off the North Carolina coast. The precise locality of the ship, signature of the writer, &c., are omitted for obvious reasons. The letter will repay perusal :—

"At present there are only four steamers blockading this place (that is on this side), you can see by looking on the map that there is a shoal makes out seaward for ——— miles; it is only ——— of a mile wide, so we are obliged to support ——— blockades. At present we are on the north side of the shoal; there are ——— steamers on the south side. We can communicate with each other by a narrow channel across the shoal. The Admiral sent a small tug boat on the other side a few days ago, while we ought to have one or two on this side, for, as you know, we require them to run close-in-shore in the night, so as to intercept the 'runners' of which there are plenty just now. Our captains think if they run into six or eight fathoms of water they are very close in, when, in fact, we are four or five miles from the shore; while the class of vessels that run the blockade draw but six or eight feet of water and can steam in and out within a mile of the shore. There were at one time eight steamers at the wharf in ———, and in one week they all got out safely, heavily laden with cotton and turpentine. There was one steamer that came down recently and anchored just inside of the bar; she had two pipes and side-wheels. We knew she was loaded ready to run out, and we kept her in check for two days. She became restive, however, and made an effort to run on the other side. I was turned out one calm night at 2 o'clock A. M.; I heard the firing of guns (some twenty were fired), and thought it was the steamer just mentioned. Sure enough! I saw that she had disappeared from her place, and that another had taken her berth. At high water this last one moved up to ———. The U. S. steamer ——— came around, and her crew said that the 'two-smoke-stacks' steamer had run out and they thought they had hit her, but 'any hit or no hit' she must be in Nassau by this time, with a cargo worth probably more than a million of dollars. In fact the rebels say that they run an opposition line that makes weekly trips. Now, if the Government would only send us two tugs this would all be stopped. I dont know but I wrote you about the steamer that run in in broad daylight; it was so, however, about two in the afternoon. It was a bold stroke for 'Johny Reb' and a successful one; we fired several shots but without effect. The rebels have several Whitworth guns on shore and our captains are afraid of them; they *only* throw five miles and do execution at that distance! This vessel has taken several schooners since her arrival here; but I have given up all hope of capturing a steamer unless by chance. The rebels are steadily putting up batteries along the coast—what they call 'two guns and casemates' they have one of about eight guns and six of two heavy guns. There is one battery being built with a large amount of tressel-work; it is made of heavy timber and runs from the sea-shore back about 1,000 yards, and has a tower some 100 feet high, in the top of which, I think, they are going to place a gun to fire down on our iron-clads, and other vessels. At the foot will be two guns and in casemates they are putting up things in good shape for us. But I think the iron-clads can get in without any difficulty, in spite of these formidable arrangements. I hope they will do it and soon too. I have no more to write this time, only we all enjoy good health with plenty of sea air and 'salt junk;' I dont think there is much danger of the gout on that. . . . . I am sorry to say that two more steamers ran in last night and had the impudence to blow their whistles —I suppose to give us warning to keep out of the way or else be run down."

HORSE-POWER.

The nominal and actual horse-power of an engine are two entirely different things. The actual horse-power means the pressure of steam in pounds upon the area of piston in inches, multiplied into the velocity of the piston in feet per minute, divided by thirty-three thousand. The working power of the engine, therefore, is in proportion to the pressure of steam. By the nominal horse-power of an engine its size and character—high or low pressure—are meant. It would be well if there were a general fixed standard recognized as the meaning of a nominal horse-power for an engine, but no such standard exists in any country, we believe. In a work lately published in London, edited by J. Hopkinson, it is stated that a nominal horse-power is different in several engineering localities. For condensing engines the "Manchester rule" is 23 square inches of piston per nominal horse-power; the "Leeds rule" is 30 circular inches per nominal horse-power. For non-condensing (high pressure) engines the Leeds rule is 16 circular inches per horse-power; the Manchester rule is 10 square inches of piston, and the Glasgow rule consists in squaring the diameter of the piston in inches and pointing off the unit figure; this is essentially the same in form as the Manchester rule, as the process of division is by 10. By the Leeds rule an engine built in that place will possess about one-fourth more power than one built in Manchester or Glasgow rated at the same nominal horse-power.

THE REBEL SHOT.—The rebels say that the projectiles used by them at Fort Sumter, with which they made such an impression on the armor of the *Monitors*, were not of English manufacture, but were the invention of a Lieutenant Brooks. They flatter themselves too much in supposing that the Brooks' balls "riddled the boasted monsters like sieves," and so they probably are too sanguine in supposing that the invention of these balls will revolutionize naval warfare anew, just as the system of iron-plating seems to have become well established. On page 276 (current volume) of the SCIENTIFIC AMERICAN, a representation of the rebel shot "drawn from life" can be seen. The manner in which the rebels came by their projectiles is explained by us on page 314 of the present number.

THE STRUGGLE ON THE RAPPAHANNOCK.—On Thursday, the 30th ult., General Hooker, with his army, crossed the Rappahannock in the direction of Chancellorsville, and on the next day he was attacked by the forces of General Lee. There was fighting between the two armies with varying success for five days, when the Union army was compelled to retreat (on Tuesday the 5th inst.) to its former position on the north side of the river. The fighting was terrific and the loss of life on both sides was immense; but at the time of our going to press, the full particulars have not reached this city.

IT IS reported that a Yankee down East has invented a machine for corking up daylight, which will eventually supersede gas. He covers the interior of a flour barrel with shoemaker's wax—holds it open to the sun, then suddenly heads up the barrel. The light sticks to the wax, and at night can be cut into lots to suit purchasers.

GAS or air when heated to 491° doubles its volume, and exerts a pressure of 15 lbs. on the square inch above that of the atmosphere.

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The Origin of Honey.

The following is an abstract of a paper on the above subject recently read before the Bristol (England) Microscopical Society, by W. W. Stoddard :—

Although honey is a familiar body, it is curious to note how little mention is made in any chemical or botanical work of the changes that take place in its elimination, of its origin, or even of its composition. Most chemical authorities simply state that the solid crystalline portion of honey is grape-sugar, but say nothing of the liquid. Johnson, in his "Chemistry of Common Life," says :—"Honey is formed or deposited naturally in the nectaries of flowers, and is extracted therefrom by the bees. When allowed to stand for some time, it separates into a white, solid sugar, consisting of white crystals, and a thick, semi-fluid sirup. Both the solid and liquid sugars have the same general properties. The solid sugar of honey is identical with the sugar of the grape." Such is the drift of the whole information that can be gathered respecting the composition of honey.

On dissecting the honey-bee, we find the proboscis continued into a beautiful ligula or tongue. It is a flexible organ, covered with circlets of very minute hairs. The ligula of the honey-bee differs from that of the other divisions of the bee family (the Andræ-nidæ), both in shape and microscopic appearance. It is probable that the bee uses the ligula by inserting it in the nectar, which would be plentifully collected by means of the hairs before mentioned. These hairs very likely answer a somewhat similar purpose to the teeth of the molluscan tongue. At the base of the proboscis commences the œsophagus, which, after passing through the thorax, terminates in an expanded sac, termed the honey-bag. This is an elastic glandular organ, placed before the entrance to the true stomach. Into this sac the saccharine fluid enters after being swallowed. Should, however, any more solid substance be present, it is forwarded into the true stomach for trituration by the numerous teeth with which it is furnished. The honey-gland also secretes a peculiar acid to be mentioned presently. The bee retains the fluid portion in the honey-sac till the proper time should arrive for deposition in the cell of the honeycomb.

At the base of the corolla of a flower, on the thalamus, is a part termed by botanists "the disc." It is that portion which intervenes between the stamens and the pistil. It is composed of bodies usually in the shape of scales or glands. When examined at the proper season, they are seen to abound in a thick, sweet fluid, which, since the days of Aristotle and Virgil, has rejoiced in the name of "nectar." On this account the part yielding it received formerly the name of "nectary." Even in the present day those organs are the subject of much misapprehension. Linnæus and his followers gave the term "nectary" to any gland or organ for whose office they could not otherwise account. The plants which furnish the greatest quantity of nectar, and are, therefore, most liked by the bees, generally excrete it from the disc of the flower. On many plants, however, as the ranunculus and fritillaria, a small glandular organ occurs at the base of each petal, and in which also nectar is enclosed, though not in such profusion as in the disc before alluded to.

As will presently be shown, the nectar is a simple solution of cane-sugar formed from the amylaceous sap of the flower, and elaborated for the nutrition of stamens and pistil. What the bees find in the flowers is the surplus left when these organs have been supplied. The author examined every flower he could collect at the early season of the year (April and May), and found sugar in them all, whether furnished with discs or nectariferous glands, or not; and came to the conclusion that sugar is necessary to the male reproductive organs of the flower, as it is in them chiefly to be found, the so-called nectariferous body merely serving the purpose of a reservoir.

The plants which in England are most attractive to bees are—mignonette, currant, hazel, wallflower, hollyhock, raspberry, broom, rosemary, lime, buckwheat, clover, willow, gooseberry, lemon thyme, heath, turnip, osier.

On examining an immature blossom of a wallflower, the vessels will be found filled with an amylaceous fluid which gives a distinct blue with iodine. After the lapse of from twenty-four to forty-eight hours, the flower having become much more expanded and the stamens more mature, the fluid on being again tested will have a sweet taste, and give a dirty bluish brown instead of a blue with iodine. On cutting out the discs of several ripe specimens of wallflower, the author obtained a sirupy, clear, colorless, fluid. This was mixed with a small quantity of distilled water, treated with lime and carbonic acid in the usual way, and filtered. The filtrate was then concentrated, and allowed to crystallize spontaneously on a glass slip. The result was a beautiful regular crop of crystals of cane-sugar. As the flower became more mature, the saccharine fluid was acted upon by the vegetable acids more and more, until at length, when the ovary being fertilized, and the flower dead, a last examination showed the saccharine residue on the withered disc to be nearly all grape-sugar, almost incapable of being fairly crystallized.

The bee, visiting the flowers when in their prime, inserts its ligula into the blossom, and laps up the greater portion of the liquid sugar, which, after passing through the œsophagus, is deposited in the honey-sac. It here comes in contact with the secreting glands, which emit an acid which the author's experiments showed to be identical with formic acid. This it is, doubtless, which causes the peculiar tingling sensation at the back of the throat when much honey has been swallowed, and which is more perceptible to some than others. The bee, after its arrival at the hive, empties the contents of the honey-sac into the comb, where it remains until the store of honey is taken. When separated from the comb, the purest honey is a clear, thick liquid, which after standing becomes thicker, till at length it "sets," as it is technically called. A small bit of this, placed under a quarter of an inch objective, shows that this is owing to the grape-sugar (which has gradually been forming at the expense of the cane) crystallizing out in extremely thin, regular, six-sided prisms. All the cane sugar is retained in the liquid portion of the honey. This crystallization proceeds as the whole of the cane-sugar becomes converted into grape. When this takes place, so great is the proportion of crystals that the honey is said to "candy," and is not considered so good from the presence of acetic acid, which is produced by the grape-sugar, which in its turn undergoes a change through the agency of fermentation. The honey crystals are not identical with those of cane sugar.

On more closely examining a slide containing a bit of old honey, besides the prisms will be seen small bundles of crystals. These are manna-sugar. They remain after honey has been fermented, and may thus be separated. With these, small round or oval bodies will also be noticed spread over the field of the microscope, and are the pollen globules, showing in a beautiful manner from what flower the honey was collected. Of course they vary with every locality; but it is worthy of remark that a bee will only visit the same species of flower at the same journey; for the examination of a great number of bees will show that two kinds of pollen are never found on the same insect, although they may be very different on another working on the same flower-bed. A single bee, with all its industry, energy, and the innumerable journeys it has to perform, will not collect more than a tea-spoonful of honey in a single season, and yet the total weight of honey taken from a single hive is often from sixty to one hundred pounds. A very profitable lesson of what great results may arise from persevering and associated labor!

The evidence on which the author relied for the presence of formic acid was by distilling the honey and receiving the distillate in an alkaline solution. The resulting solution, after decomposition by an acid and evaporation, afforded all the usual reactions, and readily reduced the salts of silver.

The foregoing facts, therefore, clearly show that—First :—Honey is derived simply from a solution of cane-sugar, identical in every respect with that from the sugar-cane. Second :—That it afterwards receives the addition of a small quantity of formic acid from the glands of the bee. Third :—That cane-sugar afterward becomes gradually altered into grape sugar by chemical decomposition. The flavor of honey is, of course, quite accidental, and dependent on the aroma of the flowers the bees have visited.

Coal is now being mined at Portsmouth, from the Rhode Island coal-beds.

Qualities of the Best Vegetables.

There is so wide a difference in the quality of vegetables, that we are frequently surprised to see the indifference in regard to the purchase of vegetable seeds for sowing and planting. This is an error, which may readily be corrected. No person who desires garden esculents of fine quality need be without the best, if he will only take the trouble to make his selection of seeds with a little more than usual care. Somebody has laid down the following as a criterion to a certain extent, by which the quality of some leading esculents may be determined. We think him right, and commend his views :—

"In the blood beet we always look for a deep color, smooth, handsome form, small top, and sweet tender flesh. In the orange carrot, small top, smooth root, and deep orange color. In the cabbage, short stump, large, compact head, with but few leaves. In the cucumber, straight, handsome form, and dark green color. In the lettuce, large, close head, pleasant flavor, with the quality of standing the heat without soon running to seed. In sweet corn, long ears, very shriveled grains over the end of the cob. In the cantelope melon, rough skin, thick, firm flesh, and high flavor. In the water melon, thin rind, abundant and well-flavored juice, and bright red core. In the onion, thick, round shape, small neck, deep color, mild flavor and good keeping quality. In the parsnip, small top, long, smooth root, and rich flavor. In the pea, low growth, full pods, large and tender peas, rich flavor. In the scarlet radish, deep color, small tops, clean root, and quick, free growth. In the squash, medium size, dry, fine-grained, deep-colored flesh. In turnips, handsome form, small tops and tap root, sweet crisp flesh."

Those who have never seen better sorts than they possess, suppose they are of the first quality, when they may be very inferior or almost worthless when compared with the finest varieties.—*Culturist.*

Bread-making.

In order to have good bread, there are three things very essential—good flour, good risings, and a careful hand Now, if my lady friends will comply with the following directions, I will guarantee them as good bread as was ever broken by mortal. The day of hop yeast has gone by. It is not used by the country folks at the present day, only by here and there a family. Here is my way of making bread :—

Water Risings.—Take a quart pitcher and a spoon—scald them thoroughly—fill the pitcher half full of boiling water from the teakettle, which has been drawn fresh from the fountain. Let the water cool to the temperature of good hot dish-water; stir in flour sufficient to make them as thick as pancake batter; add one-fourth of a teaspoonful of salt and as much soda; cover them closely, set them where they will keep quite warm; stir occasionally. They will rise in five or six hours.

Wheat Bread.—Milk is the best wetting for bread—water will answer. Stir the wetting into the flour quite warm, then add the rising; stir it altogether to make a sponge. When sufficiently light, mix and mold into loaves. Let it rise again. The oven should be hot enough to bake a common loaf of bread in thirty minutes, without scorching or hardly browning in the least. Bread should never be cut until it is twelve hours old, and then only what is to be eaten immediately; better cut again than to have a plateful left. Who can bear to eat bread that has been sliced and dried a day or two?

Raised Biscuit.—Take some of the bread dough when light, knead a piece of butter as large as an egg into dough enough to fill a long tin—mold into small biscuits—let them rise again; bake for twenty minutes.

Indian Bread.—Take two quarts of Indian meal, pour on boiling water enough to make the meal quite wet; when cool, add a quart of flour, half a pint of risings, a little salt, and half a cupful of molasses. Mix altogether, put into large basins and let it rise; bake for three hours with a slow fire.

Johnny Cake.—A johnny cake, to be eaten with meat, should be made as follows :—One teacupful of sweet milk, one of buttermilk, a little salt and a little soda; stir in meal enough to make a soft batter; bake forty for minutes.—*Mrs. Call.*

Tenpenny nails pass current, among the inhabitants of North Carolina, at five cents each.

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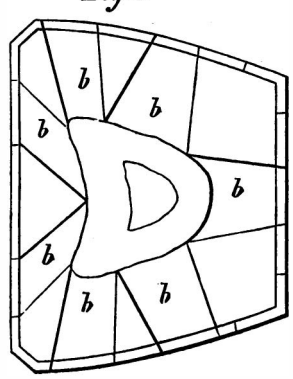
Improved Vulcanizing Apparatus.

The introduction of india-rubber into dental practice, and the favor it has received at the hands of the profession, imparts a deep interest to all improvements calculated to facilitate its manufacture. We are assured by the inventor of the machine herewith illustrated, that no vulcanizing apparatus has been devised heretofore which was capable of vulcanizing two or more pieces at one time in a proper manner. Experience proves that pieces placed one above the other cannot be vulcanized alike at the same operation, and, therefore, it is usual to vulcanize each piece separately, at the expense of two operations. The improvements here illustrated effectually overcome this difficulty by changing the vulcanizing vessel from a cylindrical to an oblong form, wherein each flask is placed side by side, and each receives a due degree of heat. : ·

Fig. 1 is a perspective view, and shows the outer ornamental sheet-iron casing, A, which surrounds the retorts and flasks. The small door at the bottom has a piece of talc let into it for convenience of observing the state of the fire. Fig. 2 shows a section of the apparatus through the flasks and retorts. The cast-iron chamber or retort, A, is lined with porcelain, and has a shoulder at the bottom on which the frame, B, sits; this frame contains the flasks, C; one of the flasks is shown in section and the other in perspective. The covers of the flasks are kept down by thumb-screws, D, working against springs, E. The water, F, is interposed to prevent the bottom from burning out; the steam is discharged through the small cock on top. The vulcanizing process is intended to be effected by gas, and the apparatus, G, at the bottom is provided for that purpose. When gas is not to be had, however, a small spirit lamp is substituted.

The thermometer ordinarily attached to vulcanizing vessels often occasions failures, by reason of breakage or leakage. The bulb being unprotected and placed within the steam chamber renders it necessary to pack the small glass tubes at great risk of breaking them. The improved mode of constructing and of applying a thermometer to a vulcanizing vessel, as shown in Fig. 2, has effectually overcome these difficulties, as will be readily seen by referring to the cut. The case is of solid brass with a socket for the tube, and the thimble or enlarged socket, *a*, for the necessary bulb, extending down through the cover into the steam, secures and protects the glass from all liability of breakage. The thermometer case may be used as a handle for removing the cover without risk or liability of fracture. When iron vessels have been used for this purpose (as is ordinarily done) the sulphurous gases acting upon the exposed surfaces of the iron produces a deposit of black oxide or sulphuret which discolors the whole interior; this injures the color of the vulcanite plates, and is effectually obviated by enameling the exposed surfaces. There has also existed, hitherto, a difficulty in packing the molds properly. The india rubber, as prepared for dental use, is slightly elastic and semi-plastic, and has to be rendered entirely so by the heat in the vulcanizing process. The difficulty laid in judging of the exact quantity of the rubber required to fill the molds; if too little is used the piece will be lost, or if too much the surplus will be

Fig. 3



forced out of the mold into the plastic joints of the cast, and coming in contact with heat, will harden and prevent the flasks from coming together; this will leave the piece too thick, change the articulation, and often spoil it. This difficulty is effectually removed by the improvements herein described and shown in Figs. 1 and 3, of providing channels, *b*, for the escape of the surplus rubber around the entire mold, and this is done by cutting away the plaster cast around the mold, to the depth of about the 32d part of an inch, and leading the channels to openings in the sides of the flasks for its escape; or recesses may be made in the plaster cast near the outside of the flask to receive such surplus. Provision for the escape of a surplus being thus made and springs provided, as shown in the drawings of Fig. 1, there is no difficulty in packing a mold; the main thing being to pack sufficient rubber to fill the whole mold, and when the rubber becomes plastic the springs will close the flasks, and the surplus will flow out into or through the channels, leaving the piece full and perfect.

An application for a patent is now pending through the Scientific American Patent Agency. The apparatus is the invention of J. L. McDermut; further information can be obtained by addressing him at 130 West Twenty-fifth street, New York City.

Fig. 1

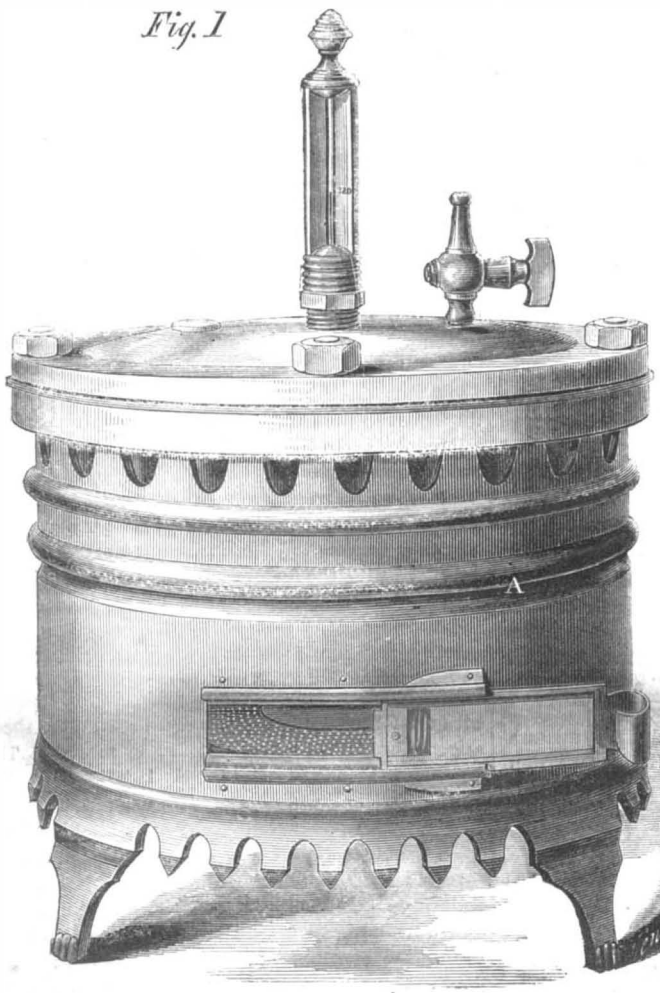
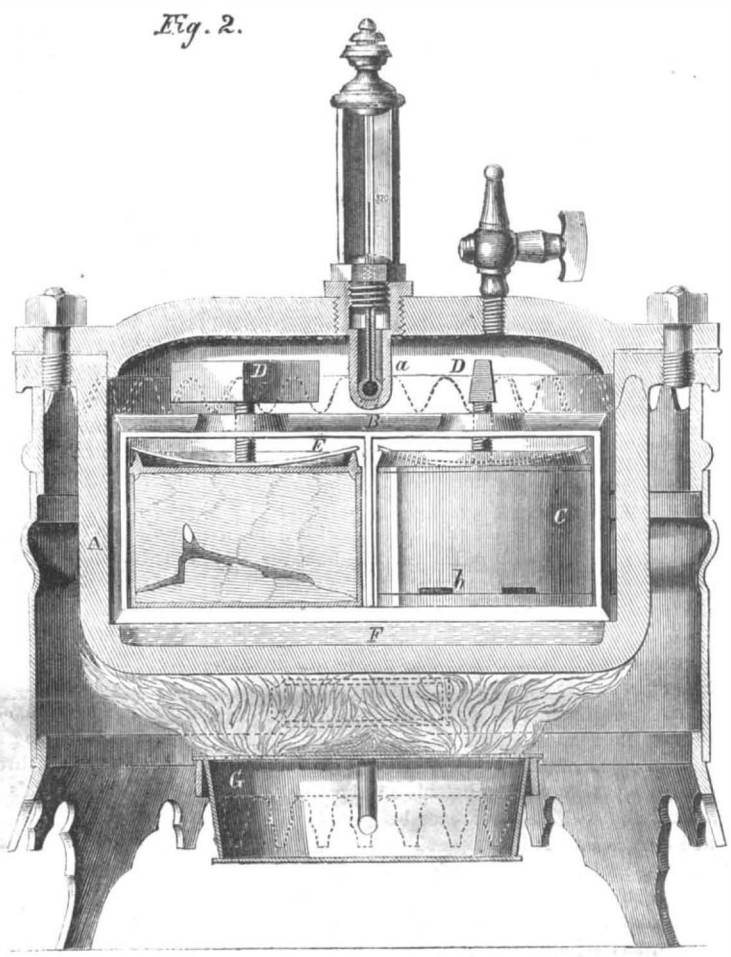


Fig. 2.



MC'DERMUT'S PATENT VULCANIZING APPARATUS.

Loss of the Steamship "Anglo Saxon."

The Montreal Steamship Company's iron screw steamer *Anglo Saxon*, which left Liverpool on the 16th of April for Quebec and Montreal, was wrecked four miles east of Cape Race on the 27th ult., during a dense fog. This vessel carried mails for Canada and the United States, and had on board 84 of a crew and 360 passengers, making a total of 444 persons. Of this number 187 have been saved, but all the others (257, it is believed) have perished. Seventy-three persons escaped on spars and the others in boats. The vessel struck upon a rock, and the deck broke up in about an hour afterwards. This company has been very unfortunate in the loss of vessels, as the *Anglo Saxon* is their sixth which has been wrecked since 1857. In order to make short voyages, the commanders of steamers are much too reckless in hugging the dangerous North-eastern coast, and running too fast during fogs.

NEW PORTRAIT OF WASHINGTON.—A new likeness of Washington, supposed to have been executed during his life-time by a French artist, has come to light at Salem, Mass., and is pronounced an excellent picture by Josiah Quincy, who knew the original.

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REFORM THESE ABUSES!

It sometimes occurs in the operations of a machine-shop that the ordinary chucks fitted to lathes will not take in the work to be done, and resort is then had to wooden blocks bolted to the face-plate and turned out to any desired form. Sometimes these blocks are screwed on to the spindle itself, but in either case they cost time and money to make. It would seem from the want of care and attention paid to these necessary appurtenances of a machine-shop that they were considered useless except for temporary purposes, and that the only disposition to be made of them is to leave them around on the floor, under the vice bench or in any hole or corner that is unoccupied by any thing else. Some men find them useful to batter mandrels or arbors into work they are about to turn, to sit upon at noon-time, to build a fire with in the mornings, they find them convenient to punch sheet iron upon; in short, wooden chucks are abused in an infinite variety of ways which seem to us altogether wrong. Put them away in a safe place like any other tool. Assuming that the block will not run true after being shifted from the lathe it can still be re-turned and employed again for work approximating in shape to the first job it received. The block out of which the chuck is made is always the best piece of wood to be had, and it is poor economy to cut up lumber to use, or rather abuse, in the manner set forth above. And in this connection it will not be amiss for us to protest against battering up the centers of shafts or mandrels by carelessness. No good workman needs to have any remonstrance addressed to him on this score; but bad ones are continually guilty of the practice referred to. If a workman wishes to damage his reputation in the eyes of all intelligent artisans he will take a heavy hammer and blunderingly whack away on the delicate center that should be as carefully protected as the pupil of the human eye. Such a course only results in mischief; in a well-regulated shop it is soon found out, and the individual committing this outrage on common sense should be immediately dismissed from the shop. It also looks very knowing, when erecting new work, to use the naked face of the hammer upon finely-polished gibs, keys and straps. If the brass does not go back to its seat, why not examine it to find out the source of the difficulty? Do not smash away on the bright flanges of it with a rough hammer. By so doing the careless artisan will have the mortification of spoiling his employer's property and of creating a reputation for himself which ought to prevent him from obtaining employment until he has changed his method of working. Carelessness and laziness are the parents of such folly as this, and no person but one utterly lost to a sense of mechanical decency would be guilty of it. We are confident that these requests will be met in the right spirit and that good results will be manifest if they are followed.

ROCKETS IN WARFARE.

All persons are familiar with the sky-rocket as used for signalling and pyrotechnic display. It mounts upwards with the velocity of an arrow in a pathway marked with its own fire. The application of rockets as destructive missiles of warfare is plausible in theory, and on some occasions they have been used with advantage, but on the whole, not with perfect satisfaction. There are many persons, however, who believe that rockets may be so improved as to become nearly as effective as artillery. The common sky-rocket is made with a paper case, and is furnished with a stick-tail, the object of which is to keep the mouth of the case (from which the fire escapes) downwards, and the rocket is thus projected by the charge contained within itself. It is said that such missiles were used in India and China, for war purposes, before artillery was known in Europe. These were common sky-rockets, each of which was furnished with a barbed arrow head. Sir William Congreve made a great improvement on the rocket as a war projectile by using a sheet iron, instead of a paper conical case, and supplying it with a central instead of a lateral stick-tail. Rockets have advantages in carrying within themselves their own propulsive power, and they neither require guns nor mortars to project them, consequently they may be carried to situations where it would be difficult or impossible to use artillery. They may also be made quite large, and an infantry soldier might carry one or two and discharge them in commencing an engagement, after which he would not be cumbered with more than his usual arms.

Rockets have also great defects, and these have operated against their general use. Their flight is irregular; they cannot be discharged with advantage against the wind, or across a rapid current of air, hence they are not so reliable as shot and shell fired from guns. The long wooden stick of a rocket acts as a lever for the wind to deflect the iron case, and to such an extent has this deflection occurred in several instances that, like boomerangs, they have returned to the place whence they were started. The Duke of Wellington entertained a strong prejudice against them on this account, yet he had always a rocket brigade attached to his army.

The original ideas of Sir William Congreve—the inventor—with respect to the use of rockets in warfare, have never been carried out fully in practice. He suggested three methods of firing them; and infantry, cavalry and artillery were to be furnished with supplies. One method of firing was by a tube singly; second, in a volley from several tubes mounted on a carriage; and thirdly, by a volley from the ground. The rocket tube is a cylinder of brass or iron, corresponding in size with the diameter of the rocket intended to pass through it. Its object is chiefly to give a correct line of flight. (No tubes were used with the earlier Congreve rockets.) This tube can be placed at any angle of elevation, and pointed like a gun. When the proper line of aim is secured, the rocket is thrust into the tube and ignited, when out it rushes on its destructive course. In the English army, the rockets have been fired in volleys from the ground with their heads towards the enemy. For the first hundred yards, they ordinarily pursue a regular course, at an elevation of about five feet eight inches, then they become very irregular in their motions and dart about in all directions. Sometimes they have proved as dangerous to those who discharged them as those they were intended to destroy. In full motion the power of rockets is tremendous, and could they be so improved as to secure certain flight, they would perhaps be as effective in the field, and for bombarding fortified places, as shells. Of course, they cannot penetrate iron plates, or smash down the solid stone walls of forts, but they scatter destruction among the ranks of soldiers, and carry flames into all combustible materials.

THE GALVANIC ACTION BETWEEN IRON AND COPPER IN VESSELS.

When two metals of different degrees of oxidation are connected together in salt water, they form a galvanic battery, and the most oxidizable metal is soon decomposed. Thus copper and iron form a galvanic battery in salt water, and the iron rusts with astonishing rapidity. Copper sheathing cannot therefore be safely employed on iron-plated ships, unless the two metals are completely isolated. Thus far no satisfactory method has been adopted for attaining such a result. Several of the wooden-framed iron-plated ships in the French navy, which have been sheathed on their bottoms with copper, have been found defective. The frigate *La Gloire* is an illustration of this. Her iron armor-plates, extending below the water line, formed an electro-galvanic couple with the copper sheathing through the medium of the salt water. After having been over a year in service, forty tuns of barnacles were scraped from her bottom when she was docked, and much of her iron work was permanently injured. This galvanic action sometimes takes place also in wooden steamers sheathed with copper. A correspondent of *Mitchell's Steam Shipping Journal* states that paddle-wheel steamers frequently foul opposite the arms and rims of the wheels. He had seen the copper sheathing of wooden steamers, both in the navy and merchant service, thickly coated to the extent of one-third the diameter of the wheels, after a voyage to the West Indies, with oysters, barnacles, coralline, worm-shells and weed—the copper becoming negative by the proximity of the iron wheels, which require to be turned frequently, lying in harbor, to prevent the inner arms from being destroyed by galvanic action. The inner arms and rims of the steam-sloop *Cormorant* were reduced to the thickness of a dollar on a single voyage, between Tahiti and Valparaiso, in 1844, and were obliged to be renewed, the copper-sheathing being unusually foul. Iron should not be allowed to come in contact in salt water with either copper or brass in steamers or sailing vessels. Copper and brass feed-pipes for boilers are objectionable on this account. For the same reason care should also be exercised that cables be not allowed to lie in contact with the copper sheathing of sailing vessels.

SEWING MACHINES IN EUROPE.

A paper was read before the Society of Arts, London, on the 8th of April, by Edwin P. Alexander, on the "History and Progress of the Sewing Machine." The credit is given to Mr. Elias Howe, of Cambridge, Mass., as being the inventor of the first practical sewing machine using two threads; and an account of the sewing-machine business in America occupies the greatest portion of that interesting paper. Most of the information relating to American sewing machines has been published in the columns of the SCIENTIFIC AMERICAN. Full credit is given to American inventors, and their improvements are highly praised.

As it respects the sewing machine in Europe, it seems that several single-thread and embroidering machines had been invented in England prior to the arrival of Mr. Howe in that country—(after having secured his patent in America in 1846)—but they were all defective. It is stated that Mr. Howe sold his patent in England to William Thomas for a trifling amount, and it has proved very unfortunate for the English people and American manufacturers of sewing machines that Howe's foreign patent should have fallen under the control of such a person. On this head Mr. Alexander says:—"Although the sewing machine was in practical operation in this country before it had been thoroughly recognized in America, it has received no radical improvement at our hands; all the most important improvements being due to American inventors. Its general introduction here was greatly impeded by the refusal of one of our first patentees to grant licenses to make or sell American machines, which by many are preferred to those of English manufacture. Had a more liberal policy been pursued, and licenses granted to all comers at a reasonable rate, the sale of machines would have been quadrupled, endless law proceedings avoided, and the profits to the patentee greatly enhanced. In 1860 the patent in question expired, and the public has since then enjoyed the privilege of selecting those machines best adapted to their special requirements, the majority of which are of American manufacture. The real trade in sewing machines has only existed in England since 1860, but the sewing machine is now beginning to make its way in various departments of manufacture in this country, and a steady demand for family sewing machines is showing itself."

At first there was a strong opposition manifested against them by English operative shoemakers, who struck generally against their employment. These very operatives have since found that their conduct was positively against their own interests. They now consider the machine to have greatly benefited them, especially in the manufacture of the lighter kinds of

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work. At present the number of sewing machines in use in Great Britain and Ireland is estimated at 60,000, while the number in America is estimated at 300,000, about 75,000 of which are used in families for domestic sewing.

THE NEW CANADIAN PATENT BILL.

There is now pending before the Canadian Parliament a very well digested patent bill, which, if it becomes a law, will enable American citizens, and all other foreigners to secure Letters Patents for their inventions in those Provinces. The bill passed its second reading on April 10th, and official and private advices assure us that it will become a law.

Under the present Canadian patent system, patents are granted only to resident subjects, who must also be inventors of the improvements for which Letters Patent are sought; thus effectually shutting out all except *bona-fide* Canadians. We rejoice in the present hope that a system so ill-advised is likely to be swept from the statute-book, and that full reciprocity in this matter is to be introduced. The bill before us contains sixty-nine sections, wherein liberal provisions are made for the protection of new inventions, designs and trade-marks; and in many respects it resembles our own laws—indeed, some of the provisions seem to have been copied from them, almost word for word.

We will present a brief digest of such features of the bill as are most likely to interest our readers. Patents are to be granted to original inventors for a term of fourteen years, and can be extended upon the proper proofs being adduced before the Commissioner of Patents, that the inventor has failed to secure, without fault, a reasonable profit from his invention. New and useful designs will be protected for terms of three and five years according to their character. Trade-marks will be protected without specified limit, to those who originate and adopt them in their business. In the case of all mechanical inventions a suitable model will be required at the time of application; in the case of designs and trade-marks, models will not be required. The twenty-ninth section provides that all Letters Patent for inventions granted under the provisions of the bill shall cease at the end of one year, unless the patentee shall have, within that period, commenced and carried on the manufacture of, or caused to be manufactured, within the Province, the articles so patented; but the time may be extended six additional months on sufficient reasons being shown to the Commissioner. This feature of the bill is designed to promote the industry of the Provinces, and is copied from the French law of 1844. We do not like this clause, and should be glad to see it stricken out; but if this cannot be done, let the time for introduction be extended to three years at least. We cannot complain of this feature with a very good grace, so long as it exists in respect to foreigners in our own statutes; the bill before us makes this application to all patentees without distinction. Patentees and assignees of patents are required to stamp the patentee's name and the date of the patent on all articles sold under the patent; but this section of the bill is defective, inasmuch as it provides no penalty for the omission—a law without some penalty for its violation is quite innocent and harmless.

The schedule of fees is somewhat lengthy, and, on the whole, higher than our own, though they are quite reasonable. We will omit their publication now, as, before the bill becomes a law, they are liable to modification. Ample provisions are also made for the prosecution of infringers, and for the punishment of frauds.

The language of the bill is quite clear and unequivocal; and, on the whole, we like its provisions. We hope, moreover, that it will be speedily adopted; but we fear on this point, as we call to mind the several futile attempts which have been made in that direction. We sincerely hope that all friends of patent-law reform in Canada will see to it that this bill is not allowed to die in Parliament for want of proper nursing.

STEAMBOAT-MEN at St. Louis say that the expenses of the Vicksburgh expedition, for the single item of chartering steamers, are $40,000 a day.

THE REBEL SHOT.

The press of the country are continually expatiating in one form or another upon the excellence of the English projectiles and the damage they did to our iron-clads in the late encounter off Fort Sumter. The theme is endless and seems to afford an unlimited amount of discussion. The inference from reading all the sensible treaties published on the matter in question, is that we have no missiles in this country capable of doing such execution as was done by the foreign shot. These foreign projectiles are spoken of as "highly polished," as "conical" as "possessing penetrative power in a high degree," in a word, endowed with every conceivable mechanical virtue which renders them extremely formidable and pre-eminent as destructive agents.

We listen with patience to these laudations, but we beg our readers to understand that as contributions to the stock of standard scientific knowledge they are not imperishable. The fact of the matter is, that the shot fired by the rebels on the occasion were partly of domestic and partly of foreign origin, and from illustrations published on page 276, current volume of the SCIENTIFIC AMERICAN, it will be seen that the rebel domestic shot are merely fac-similes of the celebrated Stafford projectile which has demonstrated its penetrative power most fully. The rebels in arms against the authority of the nation, have simply made use of the facilities afforded them by other traitors in the employ of the Government, and used them to our disadvantage. There is no particular mystery attending their possession of this formidable shot. We have fired thousands of Parrott shot and Stafford's shot and shell at the enemy. We have given them opportunities which they were not slow to improve, and they have merely picked up the missile sent them and pelted us in turn with fac-similes of their own manufacture. That the Whitworth shot and shell possess destructive properties we do not deny, but that we have equally as good, and as powerful ordnance, and as efficient shot and shell, we can prove to the utter dissatisfaction of our foes.

The Parrott 300-pounder shot is said to have pierced 9-inch iron plates heavily backed up, and the Stafford shot is known to have demolished targets composed of 7 inches of iron, with ease. There is now in the Brooklyn Navy-yard a huge wrought iron gun of 12-inch bore, unrifled, which has sent its shot through at least 6 inches of iron; the shot weighs 280 pounds and the gun weighs 21 tuns. It is the mate to the one called the "Peace-maker," which exploded on the U. S. Steamer *Princeton* many years ago, and was constructed by the builder of the celebrated Horsfall gun, over whose performance at Shoeburyness, England, the English papers have recently made such ado.

We have as fine artillery and naval ordnance in this country as the world can produce. The unofficial inventors of the North have constructed perfect armories wherein to manufacture their several weapons from all materials—wrought-iron, steel, semi-steel, and cast-iron; and quite recently the Bureau of Ordnance in Washington has advertised for proposals for wrought-iron guns, so that we may soon expect to see what our inventors can do toward substituting this variety of iron for that used by the Government heretofore. Let us have done with senseless laudation and exaggeration of our enemies' strength and prowess, and turn our eyes to objects within the legitimate scope and field of our observation. Let all the Jellybys fix their fine eyes on Borrio-boola-gha, if they choose; but let those gifted with common sense embrace the opportunity of diffusing some portion of it among their fellow-citizens.

INGENUITY OF A MASSACHUSETTS SOLDIER.—There is a beautiful and finished specimen of the ingenuity of a Yankee soldier on exhibition in Boston. It is a four-bladed knife of exquisite polish, with every part complete, including a large blade, two smaller blades and a "nail-cleaner," manufactured by a soldier of the Massachusetts 39th Regiment, encamped in Virginia, during his leisure hours. It was made from a common beef-bone, and its appearance is highly creditable to the skill of the painstaking and ingenious soldier. The scabbard of a sword, made from the same material, can be seen in the window of the same store.

DEFECTIVELY-DESIGNED BOILERS.

We understand that Mr. L. E. Fletcher, Chief Engineer of the Manchester Association for the Prevention of Steam Boiler Explosions, has nearly 2,000 boilers under his charge, and he has had more opportunities of examining into the practical causes of explosions during the past few years than any other person living. In his report for the month of March last, as published in the London *Engineer*, it is stated that during the month he examined 60 boilers thoroughly and 409 externally. The opinions of such a professional and practical man are, therefore, of great value. In giving an account of a vertical boiler which had exploded on Feb. 23, 1863, by which thirteen persons were killed and fifteen injured, he states that the iron of the boiler was in good condition, and there was plenty of water in it at the time of the accident. But "a serious oversight," he says, "had been made in the design of the boiler—the top end being hemispherical and the bottom flat. The hemispherical end would, when the steam was up and blowing off freely, have an upward pressure of nearly 250 tuns acting upon it and tending to tear it away from the bottom. There would be an equal downward strain counteracting this, induced by the pressure of the strain upon the crown and tapering sides of the fire-box combined with that upon the flat plate forming the bottom of the annular water space. As long as the attachment between the bottom and the top of the boiler held good, the two forces would be in equilibrium and the boiler remain at rest upon its bed. But should the attachment fail, the upward force would instantly shoot the top of the boiler upward with a buoyancy of 250 tuns, which is equal to the weight of a long railway train including the engine and tender. This action is exactly what took place. The flat plate at the bottom gave way, rending completely around through the seam of rivets at the outside ring of angle iron which attached it to the shell, when the boiler flew up and was carried to a distance of 160 yards from its original seat. There is nothing surprising in this, when the force of pent-up steam within so large a boiler is considered (the boiler was 20 feet high and 9½ feet external diameter), and the due appreciation of which shows how unnecessary is the supposition of the existence of explosive gaseous compounds or any force greater than steam itself, while the propagation of such theories only tend to divert attention from the real cause of steam boiler explosions."

ACTION OF SULPHURIC ACID UPON LEAD.

The manufacture of sulphuric acid is one of the most important arts, because this acid is the active agent that is used in a large number of chemical processes. It is condensed and concentrated in chambers and vessels lined with lead, as it exerts a very feeble action upon this metal. It will dissolve tin, copper, and iron with wonderful rapidity, but lead resists its action. It has generally been held by men of science that metals are less acted upon by acids in proportion to their greater degree of purity, hence lead-smelters and chemists have endeavored to secure the purest lead possible for chemical establishments. It would seem that these notions are erroneous. It is also stated in works on chemistry that sulphuric acid only acts sensibly upon lead at a temperature of 383°. This also appears to be erroneous. Mr. T. Crace Calvert, F. R. S., has lately published a paper on this subject, detailing a series of experiments made by himself and R. Johnson, with three kinds of lead and sulphuric acid, and the results of those go to prove that the purest lead is most actively acted upon by the acid. The metal chosen was common commercial sheet lead of 98 per cent. purity, virgin lead of 99 per cent. purity, and chemically pure lead. Sulphuric acid of different densities were used, and in several experiments the temperature of the acid ranged from cold up to 120°; and the lead was submitted to the acid from ten up to fifteen days. In all cases it was found that the action of the acid was about three times as great upon the pure as the most impure lead; and although the action was greater according as the temperature was elevated, still a portion was dissolved at a temperature of 64°. Such results were unexpected; they are of much interest to chemists.

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DISCOVERIES AND INVENTIONS ABROAD.

Oxalic Acid from Saw-dust.—At a meeting of the Pharmaceutical Society, of Edinburgh, a paper was read by D. M. Thomson, F.R.S., on the manufacture of oxalic acid from saw-dust by Mr. D. Dale. It was discovered more than twenty years ago by Gay-Lussac that several vegetable substances treated with caustic potash yielded oxalic acid, but on account of the high price of potash it could not be thus employed, and the cheaper alkali (soda) was found incapable of producing a like result. It at last occurred to Mr. Dale to try a mixture of soda and potash with saw-dust, and almost unexpectedly he has succeeded in obtaining as much oxalic acid as if he had used potash altogether. He uses two parts of soda and one part of potash, dissolves them in water and produces a solution of 1.35 specific gravity, into which saw-dust is stirred until a thick paste is formed. This paste is then heated on iron plates and is constantly stirred. The mass swells during this operation and inflammable gases having an aromatic odor are given off. The temperature of 400° Fah. is maintained for two hours, and then the mass is completely dried by longer exposure, taking care not to burn it. After this it is reduced to powder, placed on a filter and washed with a solution of the carbonate of soda which seems to have the power of decomposing the oxalate of potash and converting it into the oxalate of soda. To obtain the oxalic acid the oxalate of soda is boiled with milk of lime, when the acid unites with the lime, leaving the soda in solution, and it is concentrated and used over again with the potash. The oxalate of lime thus formed is now placed in leaden vessels, boiled with dilute sulphuric acid, when the sulphate of lime is formed and falls in a precipitate, leaving the oxalic acid in the solution, which is evaporated in another vessel and the oxalic acid obtained in crystals. By this ingenious process two pounds of saw-dust are made to yield one pound of oxalic acid, and about nine tuns are manufactured weekly at the works of Roberts, Dale & Co., near Manchester, England. Oxalic acid is employed for removing iron stains from straw hats and linen, and it is one of the best tests for lime in water. This new process has reduced the cost of this acid one-half. In 1851, it was sold for about 32 cents per pound; it now costs sixteen, where it is manufactured.

Steam Boilers.—A patent has been taken out by C. W. Williams, of Liverpool (the author of a most able work on the combustion of fuel under boilers) for an improvement in boilers—the object of the improvement being to increase their evaporative powers. It consists in substituting for the ordinary long tubes or flues employed in locomotive, marine and other steam boilers, sets or series of short tubes or flues of a circular, rectangular or other form, at short distances apart, the ends of each set or series being fitted into tube plates or face plates like those into which the long tubes aforesaid are united. The object of this arrangement is to increase the number of tube plates or face plates against which the flame and hot gases generated in the furnace strike. Mr. Williams states that he has found by experiment that a tube plate or face plate surface exposed to the direct action of the flame and hot gases is much more efficient than the interior surface of the tubes themselves in transmitting heat to the water within the boiler.

Drying Paper.—A patent has been taken out by T. H. Saunders and J. Millbourn, of Dartford, England, for a mode of drying paper as it comes from the machine and previous to its being introduced to the sizing vat. The usual mode of drying paper as it comes from the machine in a continuous web is to pass it over and in contact with heated cylinders. The paper thus dried is alleged to be inferior in strength to hand-made paper which is "air-dried"—the sheets being hung upon lines and dried in the air. By the new-patented method, the web of paper is made to pass over a series of skeleton drums, and during its passage it is subjected to currents of air which carry off its moisture. Paper that is "engine-sized" may also be treated in the same manner. It is asserted that machine made paper, when dried in this manner, is of as good quality as hand-made paper.

Composition for removing Boiler Incrustations.—M. Delrue, of Dunkirk, France, has taken out a patent for a preparation of oak and sumac bark, concentrated to the strength of 10° Beaume, to which is added 30 per cent of cream-of-tartar and turpentine. About three gallons of this composition are added every ten days for every thousand gallons of water in a boiler. It may be better than the numerous other substances which have been and are now used to effect the same objects.

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week. The claims may be found in the official list.

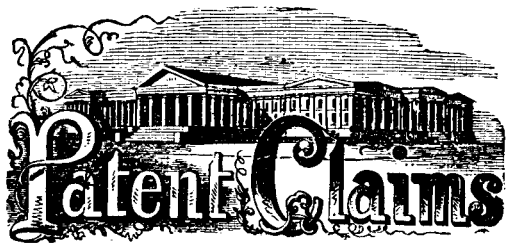
Pump.—This invention relates to an improvement in that class of pumps which are provided with a tubular piston rod to serve as a water-discharge pipe, and which pumps are submerged and used for domestic or household purposes. The invention consists in the employment of a lever arranged in relation with the check valves of the pump in such a manner that only one of the valves can remain closed at the same time, so that when the pump is stopped after use, the water will be allowed to fall in the piston rod or discharge pipe until it reaches the level of the water in the well, and consequently fresh, cool water obtained at once each time the pump is operated. The invention for this consists in a novel arrangement of the piston and valves whereby a simple and efficient means is obtained for drawing into and forcing the water from the pump chamber into the piston rod and discharge pipe. Nathan Stedman, of Aurora, Ind., is the inventor of this improvement.

Straw-cutter.—This invention consists in giving to the bottom of the box of a straw-cutter a rising and falling motion in opposite directions to the motion of the knife by the action of the same lever which imparts motion to the knife in such a manner that the stroke of the knife can be reduced one half of that of knives of ordinary straw-cutters, and still the same effect be produced which ordinary straw-cutters produce by the full stroke; and further, the leverage of the hand lever is increased and the cutting is effected quickly and with less exertion than by the ordinary straw-cutters; it consists further in the arrangement of a lever which has its fulcrum on a pivot secured in the main frame, in combination with the hand lever which is suspended at one end from a link pivoted to the main frame and which is fastened in its middle to the knife head, which is connected to the main frame by a short link, in such a manner that the hand lever, together with the knife head, receives a drawing motion, and the operation of cutting is thereby considerably facilitated. Richard Washburne, of Ramapo, N. Y., is the inventor of this straw-cutter. Address Judge S. Garrison, 22 Court street, Brooklyn, N. Y.

Direct-action Steam Pump.—This invention relates to the connection of the water and steam valves so that both shall operate at the same moment to change the direction of the movement of the pistons. Only a single valve is employed on each cylinder, such valve being of the rolling or cock kind; and the invention consists in making the connection of the said valves by means of weighted levers and a tappet arm on the piston rod, whereby a very simple and very effective system of valves and valve gear for direct-action steam pumps is obtained. J. A. Reed, of Jersey City, N. J., is the inventor of this improvement.

Adjustable Vise.—The object of this invention is to obtain a vise of simple construction which will be capable of being adjusted and secured in various positions, so that different kinds of work may be held parallel or at an inclination in any direction, as circumstances may require. The invention consists in attaching a vise of any proper or suitable construction to a ball or sphere, which is fitted in a spherical socket formed in a clamp, the parts of which are held in proper position to secure the ball and vise at any desired point by means of a lever and clasp. Norman Allen, of West Meriden, Conn., is the inventor of this vise.

A HINT TO HAY-MAKERS.—"April 7, 1863," is the correct date of the patent granted to L. Rundell, of Coxsackie, N. Y., for the simple and efficient hay-fork that was illustrated and described on page 304, current volume of the SCIENTIFIC AMERICAN.



ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING APRIL 28, 1863.

Reported Officially for the Scientific American.

*** Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

38,271.—Foot Stove.—Sterling Ackley, Hudson, Mich.:

I claim a foot-table, d d, of a foot-warmer or stove constructed substantially in manner as and for the purpose described.

38,272.—Boot.—J. Holmes Agnew, Dobbs Ferry, N. Y.:

I claim as an improved article of manufacture a boot having an opening or incision, B, in its instep provided with a lacing, D, or other suitable fastening and covered by a tongue, C, attached at both ends to the inner side of the boot below the opening or incision; all substantially as set forth.

[This invention consists in making an opening or incission in the top of the instep of the boot, and leaving said opening or incission provided with a lacing, elastic or any suitable fastening by which it may be opened and closed, and also provided with a tongue and arranged in a novel way at the inner side of the boot,]

38,273.—Vise.—Norman Allen, West Meriden, Conn.:

I claim the combination of the vise and universal joint, when the latter is provided with adjustable jaws or a clamp having a clasp and lever or an equivalent fastening applied to it and all arranged to operate as and for the purpose specified.

38,274.—Railroad.—Joseph Anthony, Greenbush, N. Y.:

I claim the following devices as described and for the purposes set forth in the above specification:—First, The anchor-sleeper. Second, The elastic cushion having double flanges. Third, The combination of the anchor-sleeper, elastic cushion, the wedge or block, the rail, the sleeper and the gage bar.

38,275.—Grain Drill.—Thomas D. Aylsworth, Pine Bend, Minn.:

I claim, first, The v-shaped drill teeth, H, attached to the rock-shaft, G, by means of the springs, I I, in the manner and for the purpose set forth.

Second, The combination of the teeth, H, rock-shaft, G, and lever, K, provided with the pulley, i, as and for the purposes above described.

Third, The combination of the teeth, H, tubes, J, and seed-rollers, D, provided with adjustable cells as above set forth.

Fourth, I claim mounting a seeding machine, provided with the teeth, H, rock-shaft, G, and lever, K, upon rollers, A A, in the manner and for the purposes above set forth.

38,276.—Sewing Machine.—Cyrus W. Baldwin, Boston, Mass.:

I claim, first, The revolving and reversible hook, K, in combination with the circular head, H, and its accompanying devices for enabling the hook to take and release the loop, constructed and operated substantially as herein described, and for the purposes set forth.

Second, I claim the bobbin or spool-holder, Q, with the spreaders, g g, constructed and operated substantially as herein described and for the purposes set forth.

Third, I claim the revolving hook, K, constructed and operated as described in my first claim, in combination with the bobbin or spool-holder and spreaders as described in my second claim, the whole constructed and operating as and for the purposes herein described and set forth.

Fourth, I claim the adjustable cam, g′, with the spring, i, the screw, j′, the cylinder, b′, and the slot, h′, in connection with the shaft, c, constructed and operating substantially as herein described for the purposes set forth.

Fifth, I claim the adjustable cam, g′, constructed and operating as described in my fourth claim, in combination with the cam or eccentric, e′, and also with the spring feeder, e′, and tough feeder, f, the whole constructed and operated as herein described and for the purpose herein set forth.

38,277.—Fly Trap.—N. P. Bassett, Fulton, N. Y.:

I claim the cover, B, when provided with an opening, c, surrounded at its lower edge by a flange, d, and used in combination with a tumbler, A, or other similar or suitable vessel, to form an improved fly-trap as herein set forth.

[This invention relates to an improvement on the simple and well known fly trap, hitherto formed of a tumbler or other similar vessel, and a piece of bread placed on its top with a hole in it, and baited with molasses or other suitable substance at its under side.]

38,278.—Sugar Evaporator.—J. A. Bowlus, Fremont, Ohio:

I claim, first, The arrangement of oscillating arms, e, with slats, g, in combination with the shaft, f, toothed segments, h, and racks, i, and with inclined sides, b, of the pan, A, constructed and operating in the manner, and for the purpose substantially as specified.

Second, The arrangement of the side channels, E, in combination with the skimmer, D, and pan, A, as and for the purpose shown and described.

[This invention consists in the arrangement of oscillating slatted arms projecting on opposite sides from a shaft which has its bearings in toothed segments rolling on correspondingly toothed racks in combination with a pan having inclined sides and provided with side channels to receive the scum in such a manner, that by means of the slats on the ends of said oscillatory arms, the scum, which naturally settles down upon the inclined sides as soon as the boiling commences, can be removed and pushed into the side channels through which it is conducted to suitable barrels or vessels, and that one operator is enabled to remove the scum from both sides of the pan without changing his position or walking from one side of the pan to the other.]

38,279.—Revolving Fire-arm.—Christopher C. Brand, Norwich, Conn.:

I claim, first, The combination of a cylinder shorter than the length of the cartridge case used therein, and having when operated a compound back-and-forth and rotary motion, and a lock in such manner that these two move together in a recess or recesses in the stock while the stock remains permanently connected with the barrel of the fire-arm, substantially as herein before set forth.

Second, The combination with a cylinder having a sliding and rotary motion, and lock moving with the cylinder to and from the barrel in a recess in the stock, of a trigger, permanently connected with the stock, the whole being arranged to operate substantially as set forth.

Third, The combination with a sliding revolving cylinder—sliding with the lock in a recess or recesses in the stock—of a lock case of such construction that it performs the functions of guiding the cylinder and protecting the lock, while moving to and from the barrel, substantially as herein set forth.

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Fourth, The combination with a sliding revolving cylinder and a lock containing guide case when moving together in recesses in the stock to and from the barrel of a percussion pin located within said case to transmit the blow of the hammer to the cartridge in the barrel, substantially as set forth.

Fifth, The combination of a lever which moves the sliding and revolving cylinder in a recess of the stock to and from the barrel, and of a mechanism for operating the revolution of the cylinder under such arrangement that when the said lever is raised on a pivot on the rear end thereof, the cylinder is drawn back and in line with the barrel and rotated upon its axis, substantially as herein set forth.

38,280.—Breech-loading Fire-arm.—Christopher C. Brand, Norwich, Conn.:

I claim, first, In breech-loading fire-arms in which a breech-pin is used, sliding in a recess in the stock and moving together with the lock to and from the barrel, I claim the breech-block recessed in front to receive the flanged end of the cartridge, in combination with a hammer and hook, the latter being pivoted by a friction joint in the breech-block and actuated by the hammer substantially in the manner and for the purposes herein before set forth.

Second, In breech-loading fire-arms in which a sliding breech-pin together with the lock is moved to and from the barrel by a lever and an intermediate link as described, I claim guiding the said breech-pin by means of a hollow guide bolt made in one piece with or permanently attached to the said breech-pin in combination with the arrangement of the main-spring within the cavity of the bolt substantially in the manner and for the purpose herein before set forth.

38,281.—Horse Rake.—S. C. Brinser, Middletown, Pa.:

I claim the combination with the teeth, C, treadle, K, levers, J H, and connecting rod, I, of the pivoted frame, N n, toothed clearer, O o, and connecting rod, P, all constructed, arranged and operating in the manner and for the purposes herein shown and described.

[By this improvement the clearing of the teeth is effected more thoroughly and with less labor than with rakes previously in use.]

38,282.—Needle for Sewing Machines.—Franklin H. Brown, Chicago, Ill.:

I claim, first, The lip, d, or equivalent, made and constructed as and for the purposes set forth.

Second, The slit, c, in combination with the hollow part of a needle, made and constructed as and for the purposes set forth.

Third, The threading hole, b, in combination with a slit and hollow part of a needle made and constructed as and for the purposes herein described.

38,283.—White Lead.—Thomas Cobley, London, England:

I claim the manufacture of white lead from crushed or ground ore carbonates of lead, by the process set forth, or by means substantially the same.

I also claim the method of treating precipitated white-lead with a caustic alkaline solution for the purpose of producing an oxy-carbonate of lead by which it is rendered more amorphous and less crystalline and the covering properties of lead are largely increased.

38,284.—Lamp.—Mills L. Callender, New York City:

I claim, first, The use and application of vulcanized india-rubber, gutta-percha or similar material as a lamp body, or the receptacle for oil, in combination with a wick-tube and burner.

Second, I claim attaching the handle to the top of a lamp or burner in the manner substantially as described, by a groove loop-spring and hook-catch, F.

Third, I claim securing the chimney holder and appliances to the lamp or burner by a spring for the purposes and in the manner substantially as represented; also combining the spring and handle substantially as represented.

Fourth, I claim using a horizontal slide, or spring-slide attached to the chimney holder for the purposes and in the manner substantially as represented.

Fifth, I claim the perforated cup, B, for the purposes specified.

Sixth, I claim the cover, J, to the perforated cup, B, when used in the manner and for the purposes substantially as described.

Seventh, I claim a corrugated metallic chimney-case arranged in the manner and for the purpose substantially as described.

Eighth, I claim, broadly, a lamp chimney-cap, N, or draught protector as described, or its equivalent.

Ninth, I claim a metallic reflector to a lamp, with an orifice in its center for the chimney to pass through.

Tenth, I claim a centrally perforated metallic reflector to a lamp in combination with a suspensory or adjustable holder or attachment, whereby the reflector is secured to the chimney at any height.

Eleventh, I claim a brevet metallic, combined reflector and shade, for the purposes and in the manner as described, substantially.

Twelfth, I claim a suspensory shade or reflector holder and slide, substantially as described when formed or cut from one piece of metal.

Thirteenth, I claim the formation of the deflector or diaphragm, L, where the opposite sides of the round flame orifice are raised or convex, so as to flatten the flame of a round wick.

Fourteenth, I claim a lamp arranged with any or all the improvements, substantially as described.

38,285.—Treatment of Metallic Silicates and the Manufacture of Hydro-fluo-silicic Acid.—Thomas Cobley, Hahl, Bavaria. Patented in England, July 9, 1861:

I claim, first, The application of fluorine for desilicizing metallic bases as herein described and set forth.

Second, The manufacture and production of fluo-silicic acid and silica by the same process simultaneously in and combination with the process for desilicizing mineral products in the manner herein described and set forth.

38,286.—Manufacture of Porcelain, Glass, &c., by the use of Fluor-silicates.—Thomas Cobley, Hahl, Bavaria, and James C. Coombe, Haxton, England. Patented in England July 15, 1861:

We claim, first, The application of fluo-silicates in combination with artificial silicates of the alkalies, alkaline earths and other earthy bases to the manufacture of glass, pottery, porcelain and other ceramic and plastic wares, and more particularly the substitution of the fluo-silicic salts of the alkalies, alkaline earths and other earthy bases for the phosphoric compounds of the same or other bases in the manufacture of glass, pottery, porcelain, and other ceramic and plastic wares.

Second, The application of the fluo-silicates of lead and baryta, either separately or together to the manufacture of glass and porcelain either as a glaze or as a pigment and either applied and used as direct or real fluo-silicates or by the admixture of any salt of lead or baryta with any fluoric or silicuous or fluo-silicous material so as to obtain the same results as if the fluo-silicate had been actually employed.

Third, The application of fluo-silicate of tin as a pigment or glaze or enamel in the manufacture of porcelain, of baryta in combination with fluo-silicate of zinc, as a substitute for lead in the manufacture of glass, and in combination with fluo-silicate of tin as a glaze or enamel in the manufacture of porcelain; and of the fluo-silicate of zinc either alone or in combination with fluo-silicate of baryta in the manufacture of glass, substantially as described and set forth in the body of this specification.

38,287.—Indurating and preserving Stone, Cement, Wood, &c.—James Cane Coombe, Haxton, England. Patented in England March 14, 1861:

I claim, first, The process herein described for indurating and preserving stone, brick, slates, wood, and other analogous materials, by the use of a solution of the fluo-silic acid, in the manner substantially as set forth.

Second, The process herein described for the manufacture of artificial stones, mortar, cement and such like substances, by the employment of hydro-fluo-silicic acid, precipitated silica, lime and alkalies, in the manner set forth.

38,288.—Clasp for closing Preserve Jars.—James A. Cowles, Chicago, Ill.:

I claim the clasp, d d d, operating and working substantially as described.

38,289.—Double Frilling.—C. O. Crosby & Henry Kellogg, New Haven, Conn.:

We claim the article of manufacture called double frilling having the essential characteristics substantially as described, or in other words made of one piece with a center line of crimps or plaits each with a well defined edge secured in place and held flat and smooth by at least two longitudinal seams, with two frills composed of crimps, extending outwards, from such seams, the crimps or plaits outside of the seams gradually expanding to the edges of the completed article.

38,290.—Window-sash Fastener.—Ephraim Culver, Shelburne, Mass., and Thomas J. Pomeroy, East Hampton, Mass.:

We claim the rod, C, the posts, A and B, and the thumb-screws, E or F, in combination for the purpose herein specified.

38,291.—Pump.—Lewis H. Davis, West Chester, Pa.:

I claim, first, The hollow cylinder, G, arranged within the barrel, A, between the cover, b, and packing, H, substantially as and for the purpose herein set forth.

Second, In combination with the packing, H, cylinder, G, and its projection, h, I claim the gland or follower, d, the whole being so arranged and constructed that the packing for the piston and piston-rod may be tightened simultaneously by forcing the said follower, d, in the cover, b.

Third, The chambers, K K′ and L, with their respective valves and openings, the whole being arranged in respect to each other, and to the chambers of the barrel, to the air vessel, and to the suction pipe, substantially as set forth.

38,292.—Propeller.—William H. Degges, Washington, D. C.:

I claim forming the blades or threads of the screw of the two plates, b b, and the cap, d, as and for the purposes herein set forth.

38,293.—Rudder.—William H. Degges, Washington, D. C.:

I claim constructing rudders of the form and having the front surface and the groove at its sides as herein set forth.

38,294.—Ship-building.—William H. Degges, Washington, D. C.:

I claim as an improvement in the construction of vessels, so forming the sides thereof as that recesses continuous throughout the length of the vessel will exist therein, as and for the purposes herein set forth.

38,295.—Cultivator.—William D. Dorsey, Decatur, Ill.:

I claim the arrangement in the manner herein shown and described, of the two adjustable share frames, I I, and the operating foot levers, L L, with each other and with the bars, E E, the pole, A, and the driver's seat, C, all as set forth.

[The object of this invention is to obtain a simple and efficient device for cultivating corn, one which will be under the complete control of the driver or operator, be of light or easy draught, and operate without injuring the corn, the latter being protected by shields.]

38,296.—Mill-stone.—Daniel Drawbaugh, Ebersly's Mills, Pa.:

I claim, first, In combination with the driving arms, and the rines, the set screws, for making uniform and equal contact between them, and thus regulate the driving force at all four points of contact, substantially as and for the purpose described.

Second, Supporting the runner on the top of the spindle by means of a removable or adjustable pin or plug, for the purpose of preserving this point of suspension as near the center of the stone, as it wears away, as possible, substantially as described.

38,297.—Chrome Compound.—Asahel K. Eaton, New York City:

I claim the chromite of baryta, as a new article of manufacture.

38,298.—Ink for printing Bank-notes, &c.—Asahel K. Eaton, New York City:

I claim the use of the chromite of baryta as a tint for the protection of bank-notes and other similar work.

38,299.—Farmers' Boiler.—Matt Ellis, South Carver, Mass.:

I claim the cut-off, g g, and rim, b b b b, in connection with the cylinder or drum, a a a a, and boiler, K, as and for the purposes specified.

38,300.—Apparatus for evaporating Saccharine Liquids.—George E. Evans, Boston, Mass.:

I claim, first, The combination of the perforated pipes or their equivalents for conveying steam equally to all parts of the heating-chamber, with a separate vessel or steam-trap so arranged and operating as to prevent the presence of water in the said heating chamber.

Second, I claim the use of skeleton revolving disks consisting of an outer rim or plate with radial bars extending from their shaft to the said rim or plate, so as to leave large apertures in the said disks as described.

Third, In combination with rotating disks or plates a revolving fan or fans operating substantially as described.

38,301.—Alloys of Aluminum.—Moses G. Farmer, Salem, Mass. Antedated Jan. 3, 1863:

I claim the alloys within described as compounded substantially of the metals and in the proportions set forth.

38,302.—Adjustable Lamp-wick.—George Finley, Collins Township, Pa.:

I claim constructing and arranging the wick tube in relation to the burner and cone or cap of lamps, substantially as herein before described so that the wick-tube may be depressed at pleasure so far as to bring the top of the wick below the base of the cone; or cap and away from the influence of the draft, produced by the cone, the burner frame, below the cone, being furnished with an opening or openings through which the wick can be lighted or trimmed for the purposes hereinbefore set forth.

38,303.—Carbon-oil Lamp.—Orlando V. Flora, Cincinnati, Ohio:

I claim the corrugated body, or case, C, of perforated metal or material, substantially as and for the purposes herein specified.

I also claim the concave flange, D, in combination with the corrugated, perforated body or case, substantially as and for the purpose herein set forth.

38,304.—Automatic Gate.—John W. Foster, Racine, Wis.:

I claim first, Applying the power to open and close the gate to the ends of bars, N′ O′, working in guide slots, o, above and below stationary points, i, upon which the gate is supported.

Second, The boss, E, working upon a vertical guide-rod, F, and employed in combination with levers, C and H, to communicate the required motion to the gate or gates from a weight applied to any part of the platform, B.

Third, The described combination and arrangement of the levers, C H K M, connecting rods, J L R and R′, and springs, G and S, with the platform, B, and gate or gates for the purposes specified.

[This gate is composed of what are known as "Jacob's ladder," or "lazy tongs" frames. It is exceedingly sensitive in its action. On the approach of a vehicle, animal or person which it is designed to permit the passage of, the gate contracts automatically within one-eighth of its extended length and afterwards is automatically restored to its closed position.]

38,305.—Coal-oil Lamp.—Benjamin Garvey, New York City:

I claim, first, Wick-tubes, the diameter of which is determined in the manner and for the purpose substantially described in the accompanying specification, taking one-sixteenth of an inch as the average diameter of tubes for general use.

Second, I claim the combination of two or more such wick tubes, for the purpose of producing one large flame by the combination of two or more small flames, in the manner described, substantially in the accompanying specification.

38,306.—Dying Wool, Silk, &c., with Aniline Colors.—Robert H. Gratrix, New York City:

I claim the application to yarns or fabrics made of worsted, wool silk or other animal substances, of the solution herein specified preparatory to dyeing with colors derived from aniline or analogous substances, substantially in the manner described.

[This invention applies to yarns or fabrics made of worsted, wool, silk or other animal substances not mixed with cotton or other vegetable substances, and the invention consists in the application to such yarns or fabrics of chloride of lime and sulphuric acid in certain proportions, preparatory to the dyeing process.]

38,307.—Washing Machine.—Isaac Haldeman, Bucyrus, Ohio:

I claim, first, The serrated boxes, a, for the purpose herein fully described.

Second, I claim the construction and arrangement of the truncated rollers, h, in the manner herein set forth.

Third, I claim the boxes, a, combined with the rollers, h, and the manner of constructing the tub, B, the whole arranged substantially as herein set forth.

38,308.—Pump.—William M. Henderson, Baltimore, Md.:

I claim, first, The arrangement of the pump barrel, A, and the air vessel, C, as herein set forth.

Second, Two suction valvular pistons connected and moving together in the same line in a single barrel; the valves opening at different times and in opposite directions, yet moving with their pistons through the cylinder at the same time and in the same direction at any one stroke, in combination with a cylinder having a central suction pipe attached thereto, so as to be always between the two suction valvular pistons at all points of the stroke, as described.

38,309.—Mode of pointing Tags of Shoe-strings.—James Hill, Providence, R. I.:

I claim cutting a tag slantwise at its end and compressing and reducing it tapering or conically, the whole being substantially as represented.

38,310.—Washing Machine.—Paul Keller and Joshua Rogers, of Sublette, Ill.:

We claim the cross partition, G, dividing the rubber, D, into two compartments, when the said rubber is used in connection with the removable sections, B B′, the whole arranged, combined and operating substantially as and for the purposes herein set forth.

38,311.—Mode of Converting Motion.—Stephen C. Ketchum, Winchendon, Mass.:

I claim the combination of the rotating shaft, E, disk, B, hooked and slotted rod, D, and pin, c, the whole arranged and operating substantially as and for the purpose herein specified.

[This device, for converting rotating into reciprocating motion, is composed of a rotating shaft, a grooved disk secured to the said shaft and a slotted, hooked rod carrying a pin, which enters the groove of the disk.]

38,312.—Machine for making Trimming.—Eugene Joseph Laurent, New York City:

I claim a rotating pattern block fitted with projections suitable or holding trimming until its members are fastened together, the design of the trimming being determined by the arrangement of said projections.

I also claim the combination of said rotating pattern block with means for holding it from turning, the whole operating substantially as herein set forth.

I also claim the combination of said rotating pattern block with a cord tension, the whole operating substantially as herein set forth.

I also claim the combination of said rotating pattern block with one or more supports for thread bobbins, substantially as herein set forth.

I also claim the combination of said rotating pattern block with a holder for supporting the same, the whole operating substantially as herein set forth.

I also claim the combination of the said rotating pattern block with a stripper, the whole operating substantially as herein set forth.

38,313.—Corn Planter.—William H. Maple, Chariton, Iowa:

I claim the shaft, K, provided with a crank, i, and the lever, I, connected with the crank, i, as shown, for operating the seed-slide, H, when said parts are applied to, or used in combination with, a beam, A, having three shares, E C C, attached to it, and all arranged as set forth.

[This invention consists in a novel seed-distributing device arranged in such a manner that it may be readily operated by hand in guiding the machine, and having said seed-distributing device applied to a frame provided with three shares, all being arranged in such a manner that the implement will form the furrow, drop the seed and cover the same, and be capable, when desired, of being used as a cultivator without any change in the position of the parts.]

38,314.—Manufacture of Wooden Moldings or Strips for the Frames of Mirrors, Pictures, &c.—Robert J. Marcher, New York City:

I claim a molding or strip for the manufacture of picture and other frames, constructed of two parts or portions, A B, connected together in the manner substantially as herein set forth.

[This invention relates to an improvement in that class of moldings or strips for mirrors or picture frames, which are provided with an inner gilt portion or edge.]

38,315.—Hand Stamp.—George McClement, Philadelphia, Pa.:

I claim, first, The combination of the type box constructed substantially as described, handle-bed, A, and adjusting and holding devices, c and d, all in the manner and for the purpose set forth.

Second, The combination of screw-threaded handle-bed, A b, type box, B a, and screw, d, or its equivalent, in the manner and for the purpose described.

38,316.—Screw Wrench.—A. Y. McDonald, Dubuque, Iowa. Antedated April 8, 1863:

I claim the sliding jaw, U, provided with the spring, E, in combination with the stop, H, and screw, F, the latter being fitted in an internal or female screw, a, in the jaw, D, and the stop, H, provided with a projection, c, to fit in holes, d, in the shank, A, of the stationary jaw, C, substantially as and for the purpose herein set forth.

38,317.—Gate.—William L. McDowell, Philadelphia, Pa.:

I claim combining the draw-bar, B, with a basket grate, A, by removing the horizontal and curved portions of the two bars, a′ a′, of latter, and connecting the two adjacent bars, a2 a2, together by means of the depressed cross-piece, a3, constructed substantially as described, to serve as a retaining support for the front end of the said draw-bar, B, while its rear end is supported in the depression, a4, with its upper side in the same horizontal plane as the upper sides of the remaining bars of the grate, substantially as described and set forth, for the purpose specified.

38,318.—Stove.—William L. McDowell, Philadelphia, Pa.:

I claim, first, The employment of a perforated supplementary top-plate, C, in combination with the usual top-plate of the base of a stove, substantially in the manner described for the purposes specified.

Second, The employment of a series of deflecting plates, D D1 D2 D3, arranged and supported around the cylinder or fire-box of a stove so as to operate in the manner described and for the purposes specified.

38,319.—Stove.—David H. Metcalf and Charles F. Bock, Battle Creek, Mich.:

We claim, first, Combining with a sheet-iron "air-tight" stove a short air-heating chamber, d, perforated bottom, c c c, air-heating chamber, E′, and exit pipes, g g, substantially as described.

Second, A sheet-iron "air-tight" stove having the double-bottoms, b E, and the air-space, E′, substantially as and for the purposes described.

Third, A sheet-iron, "air-tight" stove so constructed with conducting pipes, f, or their equivalents, that it is an air-heater below and a radiator above, in the manner described.

Fourth, The damper openings, g g, and exit pipe, f, in combination with the air-chambers, d E′, and single-wall top, G, substantially as described.

38,320.—Coffee-roaster.—C. A. Mills, Hazel Green, Wis.:

I claim the combination of the air-entrance, F, and the fan, D, with the air-case, E, the spring, C, and the roasting vessel, G, as herein shown and described, so that the movement of the latter will be regulated and the spring will be kept cool, all as set forth.

[This invention and improvement consists in combining clock mechanism with a coffee-roasting vessel or receiver in such a manner that the latter will, when placed over a fire, be rotated and the coffee roasted in a proper manner without the care of an attendant or any manipulation whatever, after the mechanism is wound up and the roaster properly adjusted for use.]

38,321.—Revolving Fire-arm.—Daniel Moore, Brooklyn, N. Y.:

I claim, first, The circular abutment, 2, at the rear end of the cylinder, partially closing the chambers, in combination with a fixed abutment, 3, projecting from the stock and covering the open portion at the rear end of the chamber on line with the barrel, as set forth.

Second, I claim the gate, o, fitted to swing on the center, 8, upon the bracket, c, of the barrel, and when closed retain the cartridge cases in the chamber, as set forth.

38,322.—Metal Cartridge for Cannon.—Willis E. Moore, Crawfordsville, Ind. Antedated Dec. 18, 1861:

I claim, 1st, Effecting the discharge of the metal case of a cartridge, substantially as set forth.

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Second, A cartridge made of taper form and with one or more weak points in its circumference, substantially in the manner and for the purpose set forth.

38,323.—Straw-cutter.—Jacob H. Mumma, Harrisburgh, Pa. :

I claim, first, The ribbed and toothed roller for drawing and masticating the straw.

Second, I also claim the flanged roller underneath for assisting the drawing of the straw forward to the cutter bar.

38,324.—Sash-fastening.—J. R. Murphy, Pittsburgh, Pa. :

I claim a sash fastener composed of two pivoted knee-shaped pieces with cam-shaped presser feet controlled by spring the whole being constructed, arranged and operating in connection with the window-frame to hold the sash at any fixed point therein without the necessity of notches, rack or other holding mechanism, substantially as herein described and described.

38,325.—Umbrella.—Walter P. Newhall, New York City :

I claim an umbrella, its rod or bow, having the eye or loop for attaching the brace thereto, formed from the continuous length of the said rod or bow by bending it in the shape substantially as hereinbefore described.

38,326.—Photographic Printing Frame and Slide.—Marcus Ormsbee, New York City :

I claim, first, A perforated slide, D, of metal or other material, adjustable in its proximity to the negative plate, substantially as described.

Second, In combination with a main perforated slide of any suitable construction, I claim the separate, independently-adjustable, perforated screens, E E, employed in the manner and for the purposes set forth.

Third, The use of the doubly-ground glasses, G G, in the manner set forth, to soften and equalize the light.

[By means of this apparatus any number of pictures can be printed with accuracy at one operation. The perishable parts are protected so that no injury can result to the apparatus or the pictures by an accidental exposure to rain.]

38,327.—Window Ventilator.—George W. Otis, Lynn, Mass. :

I claim a ventilating attachment to a window, consisting of the parts A B C X and w, or their equivalents, when arranged and combined with the sash and glass all as herein shown and described.

38,328.—Beehive.—Leonard Parker, Winterset, Iowa :

I claim, first, The miller trap, g, when arranged and constructed as herein described for the purpose set forth.

Second, The frame, s, for brood comb, when used in combination with the homestead, d, as herein described and for the purpose set forth.

Third, The arrangement of the guide, m, doors, o, and perforated cover, p, when used in combination with the alighting board and entrance to the hive, as herein described and for the purpose set forth.

38,329.—Shingle Machine.—S. J. Parker, Williamsport, Pa. :

I claim the vibrating block, M, provided with the forks, o o, and connected with the ratchet wheels, D D, by means of the connecting arms, L L, crank arm, E E, and pawls, l l, when the same is operated by means of the stationary friction roller, q, or its equivalent, in such a manner that the carriage is allowed a free movement forth and back, and the said ratchet wheels are actuated equally, whether the reciprocations are long or short, the whole arranged, combined and operating substantially as herein set forth.

I also claim the feed roller, C, made of a hollow, metallic cylinder, with the shaft, F, passing through it, and with perforations in its periphery, through which are driven the points, f f, clenching against the shaft, the whole arranged as described, so that the roller is unaffected under all conditions, and feeds the bolt equally and uniformly, substantially as specified.

I also claim securing the shaft, E, of the forward feed roller, in hinged bearings, h h, and bracing it against side movement by means of a central-jointed bearing, e, which allows it to adopt itself with equal pressure to an inclined or uneven end of the shingle bolt, substantially as herein described.

I also claim, in combination with the feed roller supported by hinged bearings, h h, the vertical shaft, G, jointed connecting bar, I, and sliding rod, H, for expanding the rollers for inserting the bolt, the whole arranged and operating substantially as herein set forth.

I also claim the combination of the two separated spring sliding rods, H and I, so arranged that they allow the carriage to slide freely forward and back without impediment, but come in coincidence when the said carriage is drawn fully back, so that the feed rollers may be expanded by their action, substantially as herein described.

I also claim, in combination with the curved sliding stop-bar, S, having notches, a′ a′, or their equivalents, the adjustable gage rod, U, provided with the horizontal arm, n′, the whole arranged so that the length of stroke of the carriage is adapted to the size of the bolt to be sawed, substantially as herein set forth.

In combination with the subject-matter of the preceding clause, I also claim the inclined track or way, T, arranged substantially as and for the purpose herein described.

I also claim the shoulder, k′, of the stop-bar, S, the eccentric, d′, stop, b′, cam, w, and sliding sleeve, Q, provided with the friction roller, v, or its equivalent, in combination with the pinion, O, for the purpose of coupling and uncoupling the latter to and from its shaft, arranged substantially as herein described.

I also claim connecting the eccentric shaft, R, with the vibrating lever, C′, by means of the inclined crank, p′, connecting bar, W, provided with the slot, q′, arm, A′, and rock-shaft, B′, the whole arranged and combined in such a manner that the said eccentric shaft is turned backward by the action of the lever, so as to permanently uncouple the driving pinion at any time, and so that the automatic action is carried on without impediment, substantially as herein specified.

I also claim the cross-head, H′, of the driving shaft, in combination with the spur-wheel, D′, provided with the pins, t′ t′, and the spiral spring, I′, arranged and operating substantially as and for the purposes herein set forth.

38,330.—Machinery for separating the Fibers of Tropical Plants.—Edward Juanes y Patrullo, New York City :

I claim the improved machine herein described for the preparation of the fiber of Agave Americana and the like tropical plants, the same consisting of a drum with widely-separated combs formed with teeth, b b, and scraping surfaces, b′, substantially as represented, operating at a high velocity within and under a closely-fitted stationary case, and combined with feed rolls adapted to allow the presentation and removal of the leaves, substantially in the manner and with the advantage herein set forth.

38,331.—Gate.—James M. Pierce, Mokena, Ill. :

I claim the combination of the rising and falling gate-carrier or rail, C, with the shoulders, f, gate, B, and cords, h, in the manner herein shown and described; so that by pulling one of said cords the gate will be opened and fastened open; and by pulling the opposite cord, the gate will be removed from the shoulder, f, and caused to close by its own gravity, all as set forth.

[This invention consists in hanging the gate or door on an adjustable rail, the latter being arranged in such a manner that it may, by means of chains or other suitable means, be inclined and admit of the gate or door opening and closing by its own gravity. An engraving of this invention will shortly appear in the SCIENTIFIC AMERICAN.]

38,332.—Flue Wall for Salt Blocks.—Timothy R. Porter, Syracuse, N. Y., and George H. Cook, New Brunswick, N. J. :

We claim the application of hollow walls to the construction of flue walls in salt blocks, substantially as set forth in the foregoing description and drawings.

38,333.—Press.—William C. Ray, Redington, N. J. :

I claim the combination of the screw, J, pivoted nut, I, yoke-lever, F, and links, G, with the weighted levers, D; the whole being arranged and operating as described for the purposes set forth.

38,334.—Direct-action Steam Pump.—John A. Reed, Jersey City, N. J. Antedated Jan. 23, 1863 :

I claim the combination of the two cock valves, B D, on the steam and water cylinder, the levers, d d′, weights, E E, tappet rod, f, and tappet arm, h, on the piston-rod, the whole combined and operating substantially as herein specified.

38,335.—Mode of preventing the counterfeiting of Bank-notes, &c.—Isaac Rehn, Philadelphia, Pa. :

I claim the combination of the work of engraved plates with photo-lithography or other modes of photography upon metal or other substances from which impressions may be printed in ink for the production of bank-notes or paper values, as set forth in the above specification and accompanying exhibits.

38,336.—Revolving Fire-arm.—James Reid, New York City :

I claim, first, The nipple breeches screwed into the rear ends of the chambers in the revolving cylinder, in combination with the recoil plate at the rear of the cylinder, fitting in such a manner as to allow of the removal of said screw nipple breeches and the introduction of fixed ammunition, as set forth.

Second, I claim the segmental plate, i, fitted, as specified, on the side of the recoil-plate, h, to cover the rear ends of the cartridges in the chambers, 2 2, as set forth.

38,337.—Cultivator.—Robert Rice, of Georgetown, Ill. :

I claim, first, the connecting of the front ends of the bars, a a, of the implement to the draught pole, B, by means of the elastic plates, b b, in combination with the cross-bars, c c, fitted to the draught-pole, B, and passing loosely through the bars, a a, and with the braces, e e, attached to the plow standards, C C, and the cross-bars, c c, as herein set forth.

Second, The handles, E E, attached at their front ends to the draught pole, B, by means of screws or bolts, g, in combination with the spring or elastic bar, l, and the upright, D, on which the rod, h, bears, substantially as and for the purpose herein specified.

[The object of this invention is to obtain a cultivator or cultivator plow of simple construction which will be extremely strong and durable, and admit of being readily adjusted so as to suit the width of the spaces between the rows of plants, and also admit of being manipulated or guided with greater facility than those hitherto used.]

38,338.—Hand Saw.—Thomas D. Roberts, Utica, N. Y. :

I claim, first, A saw-frame, B, constructed of a single piece of wood bent in the form substantially as and herein shown and described.

Second, The nut, D, and screws, d d, applied to the bars, C C, and the latter arranged with the saw frame, either constructed as shown or in any proper manner, for the purpose of straining the saw-set, as set forth, and this saw-straining device I claim, whether one screw, d, is used or both of them, as herein set forth.

Third, The combination of the saw frame, B, constructed of a single piece of wood, as shown, with the nut, D, bars, C C, and screw or screws, d d, as herein specified.

[This invention relates to an improved mode of constructing the saw frame and also in an improved means for straining the saw, whereby the latter may always be kept, with the greatest facility, in a proper taut state for, and the saw also readily relased and taken from the frame when it is necessary to file or set it.]

38,339.—Musquito Canopy.—Samuel Roebuck, Brooklyn, N. Y. :

I claim, the head, A, formed of a socket, a, and flange, b, the latter being provided with loop-projections, d, and shoulders, e, the loop projections being provided with indentations, f, which, in connection with the shoulders, e, hold the wire, D, in proper position for the purpose specified.

[This invention relates to an improvement pertaining to the frames of musquito canopies for bedsteads, and consists in a peculiar manner of constructing the metallic head in which the arms of the head are fitted, and in a peculiar manner of applying the arms to the head, whereby said arms are firmly held in proper position when the device is in use or applied to a bedstead, and also rendered capable of being folded compactly, when not required for use, and stowed away in a small space. The head aforesaid, by its construction, being rendered capable of being cast in one piece at a trifling expense.]

38,340.—Machine for breaking Hemp and Flax.—Gelston Sandford and James F. Mallory, New York City :

We claim, in mechanism for operating rollers for breaking or cleaning flax, hemp or other like fibrous substances, imparting to such rollers a reciprocating rotary motion by means of a crank connected with an arm vibrated thereby, substantially as described, in combination with an additional rotary motion operating in one direction only and imparted by a pinion, or the equivalent thereof, on the crank-pin, and communicated by cog-gearing to the rollers, the axis of the intermediate gearing being connected with the vibrating arm, which transmits the reciprocating motion to the rollers, substantially as and for the purpose specified.

38,341.—Device for the Construction of Brooms.—S. M. Sherman, Fort Dodge, Iowa :

I claim the two bars, A A, in combination with the jointed bar, F, and the plunger, the latter being formed of the jaws, E E, side pieces f f, and cross-bar, e, and operated by the screw, C, or its equivalent, all arranged for joint operation as and for the purpose specified.

[The object of this invention is to obtain a device of simple construction which will greatly expedite the making of brooms and diminishing the labor attending the same, and also enable the brooms to be made in a superior manner to those made by the exclusive manual process.]

38,342.—Deck Light for Vessels.—John Sutten and James Gregory, New York City :

We claim, first, The combination of the slot, A, in the hinge, E, of the frame containing the glass, with the fixed pin or bolt, a, and the bearer, f, of the base-plate, g, or equivalents, as and for the purpose herein fully shown.

Second, The combination of the sliding screw-bolt, G, having an oblong channel, B, with the lugs, D, of the door-frame, and base-plate, g, as and for the purposes herein fully shown.

Third, The combination of the frame containing the glass, F, with the web, C, as and for the purpose fully shown.

38,343.—Lumber Raft.—George W. Towar, Detroit, Mich. :

I claim, first, The formation of the bow crib, A, as shown and described.

Second, The arrangement of the windlasses, D D, at the ends of each crib, for the purpose of producing an adjustable coupling, as specified.

Third, The pickets, B, in the sides and end of cribs, in combination with fenders or wales, G, enclosing and protecting the pickets, as and for the purpose set forth.

Fourth, The traverse timbers, b b′, securing the bottoms and tops of cribs, as described.

[This invention consists in the arrangement of pickets in the sides and ends of each crib of a raft in combination with one or more fenders encircling the pickets and screwed by lines or chains and with traverse timbers fastening the bottoms and tops of the cribs in such a manner that a large quantity of lumber can be placed on each crib and fastened perfectly secure, and that a raft is produced capable of passing with perfect safety and without loss through rough weather and heavy seas.

38,344.—Construction of Gunboats.—L. M. Van Sickle, Woodbury, N. J. :

I claim, first, The arrangement of the extra plates, H, on the outer edges of the gunwales, D, in combination with the side propellers, G G, constructed and operating as and for the purpose specified.

Second, The arrangement of spiral flanges, b, projecting from the propeller shafts, c, in combination with a series of single blades, a, fastened to each other and to the flanges, b, by means of rivets or bolts, substantially as and for the purpose specified.

[This invention consists in the arrangement of two propellers, one on each side of the boat and about in the middle of its length, in combination with extra plates attached to the outer edges of the gunwales over the propellers in such a manner that, by said extra plates, the propellers are fully secured against injury from an enemy's vessel, and, by the action of the propellers, the boat can be speedily turned in any direction. The invention also consists in securing the blades of the propeller to spiral strips projecting from the shaft and to each other, by means of rivets, in such a manner that, in case one of the the blades should break or become injured, it can be readily removed and replaced without disturbing the other parts of the propeller.]

38,345.—Extension Ladder.—L. F. Ward, Marathon, N. Y. :

I claim the inclined planes, P P, in combination with the spring catches, P′, for locking the sections.

I claim the construction of the ladder in the manner and for the purpose substantially as described.

38,346.—Straw-cutter.—Richard Washburn, Ramapo, N. Y. :

I claim, first, The combination of the reciprocating bottom, C, with the reciprocating knife, E, in the manner substantially as herein shown and described, so that both the knife and the bottom shall have a simultaneous movement to and from each other, all as set forth.

Second, The arrangement of the lever, G, in combination with the hand-lever, D, link, d, knife-head, F, and link, b, all constructed and operating in the manner and for the purpose herein shown and described.

38,347.—Preparing Grain, &c., for Malting.—Sigmund Weidenfield, New York City :

I claim mashing Indian corn, or any other kind of grain, by a cold solution, substantially as described.

38,348.—Beehive.—Joseph H. Welty, Mount Carroll, Ill. :

I claim the application to beehives of the combination of the slotted tube, B, its slide, C, and the wire, D, when used as and for the purpose substantially as delineated and specified.

38,349.—Lamp-wick.—Andrew Judson White, Brooklyn, N. Y. :

I claim a machine-made wick composed of unspun cotton, flax or jute covered and held together with gluten.

38,350.—Magazine Field Battery.—James O. Whitcomb, New York City :

I claim, first, One or more rotating cylinders or chamber blocks in combination with the insulated igniting devices for discharging said chambers by electricity, when arranged at the breech of barrels as herein set forth and represented.

Second, I claim the general arrangement and operation of the ratchet, R, and spring, X, with the lever, L, clich, c, and spring, t, when the ratchet, R, is fixed in the common shaft or axis, a, with one or more of the rotating cylinders or chamber block, C, as herein set forth and represented.

Third, I claim the chargers, d d d d, working into the sockets, G G G G, when used separately or in series, for the purpose herein set forth and represented.

Fourth, I claim the sliding bar, m, with its two wedge-shaped pieces, 1′ 1, working against the studs of the springs, 2′ 2, in combination respectively with the rods, I I, the check wires, 6′ 6′ 6′ 6′ and 6 6 6 6, and also with the springs, h′ h, substantially as and for the purpose herein set forth and represented.

Fifth, I claim the bullet pressers, D D D D, carrying the galvanic or voltaic battery wires, p p p p, as herein set forth and represented.

Sixth, I claim the relieving wires, k k k k, fixed to the shaft, w, when made to work into and out of the bullet holders by motion communicated from the shaft, e, through the arms, v and M, and pitman, l, to said shaft, w, as herein set forth and represented.

38,351.—Wood Horse.—Enoch Whittemore, North Paris, Maine :

I claim the combination and arrangement of the jawed lever and its treadles with the wood horse, the same being substantially as and to operate together as specified.

38,352.—Apparatus for casting Fuses.—George Wright, Washington, D. C. :

I claim, first, Removing the cope, e, and nowel, f, from the fuse, while the latter is firmly held and supported by the cheeks, K K, or their equivalents, for the purpose herein set forth.

Second, The arrangement of the cams, G G, parts, e and f and K K, and the means of guiding the same, substantially as and for the purpose herein set forth.

Third, Molding and removing a secondary part in the same machine with the main part, substantially in the manner and with the advantage herein set forth.

38,353.—Composition for preserving and water-proofing Leather.—Robert K. Wright, Philadelphia, Pa. :

I claim the above-described composition for preserving leather made of the ingredients enumerated, mixed or compounded in about the proportions specified.

38,354.—Manufacture of Silicated Soap.—D. B. Chapman (assignor to himself and E. D. Draper), Milford, Mass. :

I claim the combination of an alkaline silicate, a sulphate of soda or an anhydrous carbonate of soda, and a farinaceous or mucilaginous substance, the whole being substantially as described and for use as an ingredient of soap.

38,355.—Lantern.—Chas. Deavs (assignor to Archer & Pancoast), New York City :

I claim, first, The case or body, C, of the lantern formed of the glass plates, e e, and a sheet-metal portion so cut or shaped as to form, when bent, two sides, a a, and the top, b, of the case or body, the lower ends of the sides being connected by crossbars, c c, substantially as set forth.

Second, The combination of the case or body, C, constructed substantially as described, with the lamp, A, the former being connected to the latter by hinges or joints, D, as and for the purpose specified.

Third, Forming the sheet-metal sides, a a, of the lantern with beveled inner surfaces, j j, to serve as reflectors, substantially as set forth.

Fourth, The rods, F, bent at their upper ends to form pivots for the cap-piece, E, and also to form eyes for the bail or handle, G, and secured at their lower ends to the crossbars, c c, to serve as guards for the glass plates, e e, as herein described.

[The object of this invention is to obtain a lantern of simple and economical construction, which will not be liable to break or get out of repair, and which will, in case of the breaking of a light or side of glass, admit of one being readily put in by any person of ordinary ability, the lantern, at the same time, being portable and provided with reflectors.]

38,356.—Cat-block for freeing a Ship's Anchor.—G. W. Duncan (assignor to himself and Chas. Davenport), Bath, Maine :

I claim the combination of the tackle block, B, and the lever ring hooks, D D, and their chains, E E, the said block to be suspended from a cat-head or a davit by means of a fall or rope, C, and the whole to operate substantially in manner and for the purpose specified.

38,357.—Apparatus for carbureting Gas.—Stuart Gwynn, New York City, assignor to Geo. Odiorne, Boston, Mass. :

I claim, first, The general arrangement and combination of apparatus, substantially as herein shown and described, for forcing the air through a porous medium diffusely charged but not filled with fluid, so that the air shall penetrate through as well as pass over the mass of porous substance, as herein set forth.

Second, The arrangement and combination of apparatus, substantially as herein shown and described, for maintaining the proper level of the fluid and effecting the vaporization, in the manner set forth.

Third, The arrangement and combination of apparatus, substantially as herein shown and described, for generating hydrogen gas to supply atmospheric air charged with the vapor of hydrocarbon fluids in proportion to the excess of carbon it contains.

38,358.—Embroidering Machine.—Alfred Heaven and Robert Smith, Manchester, England. Patented in England March 21, 1861 :

We claim the combination of mechanism herein described for giving the carriage, B, its motion to and from the frame, D, when such mechanism is used in combination with the shipping mechanism, as set forth.

We also claim the mechanism, substantially as described, for shipping the belt, J, from the fast on to the loose pulley, and from the loose on to the fast pulley, for the purposes as set forth.

We also claim the employment of the tightened thread to actuate the shipping mechanism, as above described.

38,359.—Explosive Projectile for Rifled Ordnance.—C. W. Smith and G. H. Babcock, New York City, and B. B. Hotchkiss and C. A. Hotchkiss, Sharon, Conn. :

First, We claim, in explosive projectiles for ordnance, dividing the cavity into two parts by the plate, B, or its equivalent, supported upon

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or by the body of the shell, so that it cannot be forced backward by the inertia of the balls, C, but may be easily thrown forward by the explosion of the powder in D, substantially as and for the purpose herein set forth.

Second, We also claim the combination of the tube, E, plate B, and fuze plug, K, so arranged that the bullets, C, may be inserted through the mouth of the shell after the tube, E, is in place, and the fuse plug caused to embrace the end thereof, substantially as herein shown.

Third, We also claim an explosive projectile in which the point is cast in one piece with the body, with a weak line, G, and with the plate, B, inserted in the cavity thereof, in the manner herein specified.

38,360.—Pump.—Nathan Stedman (assignor to himself and Jos. Miller), Aurora, Ind. :

I claim the lever, F, when used in combination and placed in relation with the two valves, D E, of the pump to operate in the manner and for the purpose herein set forth.

I further claim the piston valve formed of the two annular plates, g g', connected by vertical rods, h, in combination with the holes, i, in the upper and lower ends of the piston, G, and the tubular piston rod, H, all arranged for joint operation, as set forth.

38,361.—Stove.—P. P. Stewart, Troy, N. Y. :

I claim the combination of the outer fire cylinder, c, with the annular hot-air chamber, s, and with fire-brick perforated and forming the inner fire cylinder, d, in the manner substantially as herein described and set forth.

I also claim the perforated plate, m, and cold-air chamber, k, in combination with the door, w, having therein the cold-air chamber, z, the whole being arranged over the fire chamber and annular hot-air chamber, s, and for the purposes herein described and set forth.

38,362.—Mail Pouch.—Marshall Smith, St. Louis, Mo. :

I claim the employment of the mail pouch, A B, constructed substantially as herein described and represented, having one or more compartments, provided with the securing devices, e f g f', or formed with a series of chambers, substantially as herein shown, specified, and represented, for the purposes set forth.

38,363.—Mark-holder for Bales, &c.—Porter Fitch, Brooklyn, N. Y. :

I claim, first, The blade, D, as shown in Figs. 1 and 2.

Second. The dart, D, as shown in Figs. 3 and 4.

Third, The use of the arms, F F, in connection with the shaft, E, as shown in Figs. 1 and 2.

Fourth, The use of the blade, D, the wire or chain, I, and the tag, T, in combination with the shaft, E, substantially as shown in Figs. 1 and 2, all substantially as and for the purpose described.

38,364.—Engine Lever.—T. W. Godwin, Portsmouth, Va.:

I claim, first, The lower end of the lever having slots, c c and e' e', dogs, d d d' d', and hinged joints, f, Figs. 1, 2, 3 and 4, when used as and for the purpose herein described.

Second, The cross balance bar, h, and the pivot, k, when used as and for the purpose herein described.

Third, The spring, n, and the pins, O O, or their equivalents, when used as and for the purpose, herein described.

Fourth, The eccentric loop, p, the pin, p', and the handle, r, when used as and for the purpose herein described.

Fifth, The lugs, t t', when used as and for the purpose herein described.

Sixth, The ratchet wheel, s, made of two disks, s' s', between which the lower end of the lever, a, works on a main shaft, b, all constructed substantially and for the purposes specified.

RE-ISSUES.

1,461.—Car Spring.—George Douglas, Scranton, Pa. Patented Dec. 29, 1857 :

I claim the combination of elliptically-curved plates, A and B, of different degrees of curvature in the formation of an elliptic or semi-elliptic spring, in such a manner as that, when it is under the influence of weight or pressure, one or more plates, B, of said spring, will tie the remaining plates, and, by limiting their expansion, prevent an undue diminution of their curvature and elasticity, all substantially in the manner and for the purpose herein set forth.

1,462.—Apparatus for Soda Water, Ice, Sirups, &c.—G. D. Dows, Boston, Mass. Patented Dec. 10, 1861 :

I claim arranging and combining with a rotating ice-cutter or shaver, an ice-containing receptacle in such a manner that the ice therein held shall move toward the cutter and by the revolutions thereof shall be reduced to a finely-divided state in readiness for use, substantially as described.

Arranging an ice-cutter when made to operate substantially for the purpose described, in combination with a chest containing fluid receptacles, and an ice-containing chamber, in such a manner that the chest and its contents are refrigerated by the ice which is operated upon by the cutter.

I also claim the combination of the cream chest, D, enveloping chest, A, ice chest, C, and sirup vessels, B, all arranged substantially as described.

1,463.—Pipe Molding.—John Firth and John Ingham, Philadelphia, Pa. Patented Dec. 20, 1859 :

We claim blacking pipe molds by causing a stream or volume of the wash to flow through the interior of the mold, the said stream being controlled in the manner described.

1,464.—Apparatus for evaporating Saccharine Juices.—L. P. Harris, Mansfield, Ohio. Patented January 18, 1859 :

I claim, first, An evaporating pan which allows of a bottom surface flow of the juice, and stops a top surface flow, substantially as and for the purpose set forth.

Second, A high ledge between the defecator and evaporator, for the purpose set forth.

Third, The application of an adjustable gate to an evaporating and defecating apparatus, substantially as and for the purpose set forth.

Fourth, The application of a strainer to an evaporator, substantially as and for the purpose set forth.

Fifth, The combination of two or more high ledges, each of which is constructed with an under-surface flow space in connection with shallow evaporating pans, substantially as and for the purpose set forth.

Sixth, The application of a gate or a strainer to each additional ledge which has the under-flow passage, substantially as and for the purpose described.

Seventh, The combination of a high ledge and a gate or strainer with that portion of the pan known as the evaporator, substantially as and for the purpose set forth.

1,465.—Apparatus for evaporating Saccharine Juices.—L. P. Harris, Mansfield, Ohio. Patented January 18, 1859 :

I claim an evaporating pan which is constructed with one or more longitudinal channels, so as to allow the juice to circulate and in its circulation to be deprived of its feculencies or scum, substantially as set forth.

Second, Short ledges extending out from one or both sides of the pan in combination with long ledges, substantially as and for the purpose set forth.

Third, The combination of one or more high ledges, each having an under-flow passage, one or more adjustable gates, and a system of long and short ledges, substantially as and for the purpose set forth.

Fourth, The combination of one or more strainers, one or more high ledges and a system of long and short ledges, substantially as and for the purpose set forth.

1,466.—Harvester.—Stephen Hull (assignor to himself and Wm. Van Anden), Poughkeepsie, N. Y. Patented Nov. 16, 1858 :

I claim, first, Providing a free opening between the rear inner depressed extensions, B B, of the draft frame and hinging within the same a shoe or support for the cutting apparatus, substantially as and for the purposes set forth.

Second, In combination with a cutting apparatus which is arranged to rise and fall to a governed extent at its outer end, and also to be adjusted against the side of the machine, or out of operative position, substantially as described, a small supporting wheel so arranged with respect to the cutting apparatus and the one large supporting wheel that it sustains the cutting apparatus at its inner end when the machine is cutting grain, and also acts in combination with the one large supporting wheel to sustain the inner side of the draft frame when the cutting apparatus is thrown up out of operation, substantially as herein described.

Third, Combining in a single rocking shoe, C, the advantages of controling the extent of vibration of the cutting apparatus, when the machine is in operation, and also of securing the cutting apparatus in place when it is thrown up out of action, by means substantially as described.

Fourth, Hinging or pivoting a shoe or support for the cutting apparatus of a harvesting machine directly to the depresser ends of the transverse beams thereof, substantially in the manner and for the purposes herein described.

Fifth, The small supporting wheel, J, so applied to the extended frame of the machine and with the brace, beam or shoe that it will preserve its perpendicular position, whether the finger bar be on the ground or thrown up against the machine, substantially as herein described.

1,467.—Screw Propeller.—Sidney Shepard (assignee of H. O. Perry), Buffalo, N. Y. Patented Dec. 7, 1858 :

I claim making that part of the shank end of the blades of screw propellers which enters the hub and from which the blade derives its main strength in the hub, tapering or conical in connection with a corresponding tapering or conical socket in the hub, with a key so inserted as to draw and hold the shank firmly in its place in the hub, substantially as described.

1,468.—Hinge for Stove Doors.—C. J. Woolson, Cleveland, Ohio. Patented March 16, 1852 :

I claim hanging the doors by a double or compound hinge attached to the inside of them and to the outer edge of the front of Franklin stoves and grates, so that all the connecting parts of the hinges are concealed from view when the doors are closed, permitting them to be fully opened and swung away from the front and around to the sides or ends of the stove and there folded compactly into place, again concealing the connecting hinges, as herein set forth.

1,469.—Lock.—Linus Yale, Jr., Shelburne Falls, Mass., formerly of Philadelphia, Pa. Patented May 14, 1861 :

I claim, first, a disconnecting contrivance, substantially such as specified, arranged and acting under a mode of operation, substantially as described, to attain substantially the object herein set forth.

Second, In combination with a disconcerting contrivance, substantially such as is described, I claim an apparatus substantially such as is herein set forth, for imparting to the same an enforced motion when a key handle is moved, the combination being and operating as hereinbefore described.

Third, In combination with a disconcerting contrivance, substantially such as is described, I claim a contrivance which always shoots the bolt back to the same position when the lock is fully unlocked, under a mode of operation substantially as hereinbefore recited.

1,470.—Lock.—Linus Yale, Jr., Shelburne Falls, Mass., formerly of Philadelphia, Pa. Patented May 14, 1861 :

I claim, first, The combination of a revolving tumbler with a revolving tooth, the two being relatively arranged so that a revolution of the latter moves the former, only through the angular distance from one of its teeth to the next in succession, the combination being substantially such as described.

Second, In combination with a pack or series of tumblers, set separately and in succession, I claim a vibrating fence and a bolt, and a proder stop against which the fence may abut, the whole being and operating substantially as set forth.

Third, In combination a revolving tooth or pack or series of tumblers, I claim a vibrating fence and a bolt, the whole operating substantially as hereinbefore specified.

DESIGNS.

1,749.—Envelope.—H. C. Berlin, Bloomfield, N. J., and G. H. Jones, New York City.

1,750.—Cover for a Kettle or Stove.—J. L. Hadden, Philadelphia, Pa.

1,751.—Ice Pitcher.—Ernest Kaufmann, Philadelphia, Pa.

1,752.—Spinning Flyer.—Oliver Pearl, Lawrence, Mass.

1,753.—Draught Stand for Soda Water, &c.—Carl Miller, (assignor to John Matthews), New York City.

1,754.—1,755.—1,756.—Carpet Patterns.—E. J. Ney, Lowell, Mass., assignor to the Lowell Manufacturing Company.

EXTENSION.

Sewing Machine.—John Batchelder, Boston, Mass. Patented May 8, 1849 :

I claim the combination with the endless cloth-holder of the curved bar or piece of metal, v, for discharging the cloth from its points after being sewed, all as described.

Notes and Queries

E. L., of N. Y.—Address, for the desired information, the Secretary of War at Washington, D. C.

J. M., of Wis.—George W. Blunt, of this city, has, we are informed, a dividing engine of the kind you require. J. Lederer, 412 Pearl street, this city, makes the achromatic lenses.

J. R. V., of N. Y.—You can reduce metallic silver from the chloride of silver by fusing in a crucible and using a flux. First carefully wash the chloride to remove all impurities, then dry and add twice its weight of a mixture of carbonates of potash and soda or of carbonate of soda and of borax, place in a crucible, and apply a bright red heat for about an hour,

B. L. K., of Ill.—Butter that has become rancid cannot be made as sweet as when newly-made, by any process of working it over again. Those who informed you that rancid butter could be renovated are mistaken. The rancidity is due to chemical decomposition and transformation of the constituents of the butter.

J. M., of C. W.—You say you have lately heard of a new article of manufacture called "papier-mache." You evidently do not take the papers. The article has been in use for nearly fifteen years. Your instrument can be made from it readily. To make papier-mache take 80 pounds of water, 32 pounds of flour, 9 pounds of alum, 1 pound of copperas and make a paste; mix with it 15 pounds of rosin dissolved by 10 pounds of boiled oil, and add 1 pound of litharge; add to this 60 pounds of ragdust or other suitable material and grind all together.

R. R. V., of Canada.—There are no demands for smoke-consuming arrangements for the boilers employed in this city where anthracite coal is used for fuel. In England, where bituminous coal is employed, such appliances are necessary, also in sections west of the Alleghanies, but not in the Eastern States. We believe that coal may be burned more economically in a furnace, the draft of which is produced and regulated by a jet of steam, than when the draught is produced by the hight of the chimney alone.

W. P. De S., of ———.—You can clean gold lace by washing it in hot soap-suds and afterwards with a hot solution of alum water. Gold lace is effectually cleaned with soap and water, but imitations of it are very difficult to renew. We are obliged for your attention in relation to an engraving we recently published. The scale you send us is quite thin and is very different from a piece, 1¼ inch thick, in our possession. Your scale is composed of the carbonate and sulphate of lime mixed with silicious matter.

H. W., of N. J.—Animal charcoal is formed by calcining bones, horns, hoofs, &c., in retorts. It is chiefly used in the decoloration of sirups in sugar refineries, and is superior to any other known substance for this purpose. Spanish black is charcoal made from cork.

W. Mc. D., of Pa.—"Mechanical work" means the action of a machine expressed by a definite quantity by multiplying the motion which it produces into the force opposed to it. Thus the amount of work called a horse-power is equal to 33,000 pounds lifted one foot high in one minute. A comparatively new term is now applied to this work and is called "foot-pounds;" thus, either 550 foot-pounds per second, 33,000 foot-pounds per minute, or 1,980 000 foot-pounds per hour, is a horse-power.

Messrs. Payne and Pritchard, of Corning, N. Y., desire the address of W. H. F., of Iowa, mentioned in the "Notes and Queries" of May 2d.

T. R. P., of N. Y.—You do not seem to be aware that the subtle matter in a contagious atmosphere has been obtained and analyzed.

W. B. C., of N. J.—Methylic alcohol is obtained by distilling wood in retorts. It is an inflammable volatile spirit, transparent and possesses a penetrating odor. Its taste is hot and pungent. It dissolves resins like common alcohol and is a powerful antiseptic, very effective in preserving animal substances.

Money Received

At the Scientific American Office, on account of Patent Office business, from Wednesday, April 29, to Wednesday, May 6, 1863 :—

T. S. D., of N. J., $26; I. E., of N. Y., $20; R. C., of N. Y., $20; W. B. A., of Ohio, $20; J. McN., of Pa., $50; W. N. M., of Ill., $45; J. B. R., of N. Y., $166; E. B., of Mo., $20; R. R. F., of Ill., $20; R. B. D., of Pa., $20; E. R., of Mass., $25; G. R. J., of N. Y., $43; J. B., of Wis., $25; F. B. W., of Ill., $10; W. F., of Iowa, $20; D. L. M., of N. J., $25; S. & N., of Ind., $26; W. F. R., of N. Y., $25; E. P., of Ill., $25; C. N. J., of N. Y., $15; S. B. J., of Conn., $15; J. S. C., of Mich., $14; S. R., of O., $25; S. R. S., of N. Y., $16; J. F. H., of N. Y., $66; O. L., of N. Y., $25; A. W., of N. Y., $20; E. St. J., of N. Y., $20; J. B. McC., of Mo., $20; J. J. D., of N. Y., $16; T. F. R., of N. Y., $20; V. D., of N. Y., $32; H. W. L., of N. Y., $48; R. T. A., of Conn., $20; J. C., of Mass., $100; J. G., of N. Y., $16; V. W. B., of Vt., $31; N. & N., of Ill., $16; P. I. S., of Pa., $16; F. A., of N. Y., $25; W. L. R., of Mass., $25; R. H. S., of Mich., $25; W. N., of N. Y., $15; C. P., of Pa., $16; R. W., of Iowa, $40; J. A. A., of Conn., $25; J. A. H., of Pa., $25; A. A., of N. Y., $28; E. M., of N. Y., $20; B. D. S., of N. Y., $20; J. B., of Ill., $20; C. T. D., of N. J., $16; C. O. L., of Vt., $20; P. R. C., of N. Y., $16; J. B., of Ind., $20; E. A., of N. J., $16; J. I. R., of N. Y., $20; W. & P., of Mass., $20; H. & W., of Ohio, $25; J. D. P., of N. J., $16; L. R., of N. Y., $10; I. W. B., of Mich., $75; J. J. R., of Vt., $25; D. R., of R. I., $28; C. W. T., of Wis., $16; J. S. T., of Ind., $16; B. L., of Vt., $16; M. T. W., of Ky., $10; W. H. O., of Wis., $25; T. & J. W. W., of Ill., $15.

Persons having remitted money to this office will please to examine the above list to see that their initials appear in it, and if they have not received an acknowledgment by mail, and their initials are not to be found in this list, they will please notify us immediately, and inform us the amount, and how it was sent, whether by mail or express.

Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office from Wednesday, April 29, to Wednesday, May 6, 1863:—

J. F. H., of N. Y. (2 cases) A. A., of N. Y.; T. S. D., of N. J.; H. M., of N. Y.; O. L., of N. Y.; V. W. B., of Vt.; S. B. J., of Conn.; M. and B., of Ohio; D. R., of R. I.; W. H. O., of Wis.; S R., of Ohio; J. A. H., of Pa.; J. A. A., of Conn.; R. H. S., of Mich.; W. F. R., of N. Y.; J. J. R., of N. Y.; E. P., of Ill.; W. L. R., of Mass.; S. and N., of Ind.; H. B. M., of N. Y.; G. S. M., of Ill.; F. A. of N. Y.; I. W. B., of Ill., (3 cases); F. B. W., of Ill.; D. L. M., of N. J; J. B., of Wis.; T. and T. W. W., of Ill.; M. E., of Germany; J. W. S., of Conn.; J. F. McK., of Pa.

TO OUR READERS.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona fide* acknowledgment of our reception of their funds.

INVARIABLE RULE.—It is an established rule of this office to stop sending the paper when the time for which it was pre-paid has expired.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known and inclosing $1 as fee for copying. We can also furnish a sketch of any patented machine issued since 1853, to accompany the claim, on receipt of $2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

Models are required to accompany applications for Patent under the new law, the same as formerly, except on design patents when two good drawings are all that is required to accompany the petition, specification and oath, except the Government fee.

NEW PAMPHLETS IN GERMAN.—We have just issued a revised edition of our pamphlet of *Instructions to Inventors*, containing a digest of the fees required under the new Patent Law, &c., printed in the German language, which persons can have gratis upon application at this office. Address MUNN & CO.,
No. 37 Park-row, New York.

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VOLUMES I., II., III., IV., V. AND VII. (NEW SERIES) complete (bound or unbound) may be had at this office and from periodical dealers. Price, bound, $2 25 per volume, by mail, $3—which include postage. Price, in sheets, $1 50. Every mechanic, inventor or artizan in the United States should have a complete set of this publication for reference. Subscribers should not fail to preserve their numbers for binding. Nearly all the numbers of VOL. VI. are out of print and cannot be supplied.

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Binding the "Scientific American."

It is important that all works of refference should be well bound The SCIENTIFIC AMERICAN being the only publication in the country which records the doings of the United States Patent Office, it is preserved by a large class of its patrons, lawyers and others, for reference. Some complaints have been made that our past mode of binding in cloth is not serviceable, and a wish has been expressed that we would adopt the style of binding used on the old series, *i. e.*, heavy board sides, covered with marble paper and morocco backs and corners.

Believing that the latter style of binding will better please a large portion of our readers, we shall commence on the expiration of this present volume to bind the sheets sent to us for the purpose in heavy board sides, covered with marblepaper and leather backs and corners.

The price of binding in the above style will be 75 cents. We shall be unable hereafter to furnish covers to the trade, but will be happy to receive orders for binding at the publication office, 37 Park Row, New York.

RATES OF ADVERTISING.

Twenty-five Cents per line for each and everyinsertion,payable in advance. To enable all to understand how to compute the amount they must send in when they wish advertisements inserted, we will explain that ten words average one line. Engravings will not be admitted into our advertising columns; and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.

PHYSIOGNOMY.—THE LIPS AND "WHAT THEY say," with 33 engraved illustrations, Jefferson, Jackson, Voltaire, Blumenbach, Joseph C. Neal, &c., representing Gravity, Comprehension, Concentration, Application, Love of Home, of Traveling, Patriotism, Complacency, Hate, Scorn and Contempt, Love of Praise, of Distinction, Firmness, Self-esteem, Simplicity, Friendship, Hospitality, Gloominess, Cheerfulness and Love, all indicated by the Human Mouth. Thick lips, thin lips and loving lips in the MAY number of the PHRENOLOGICAL JOURNAL. 10 cents or $1 a year. FOWLER & WELLS, New York. 1

NERVOUS DISEASES AND PHYSICAL DEBILITY, arising from Specific causes, in both sexes—new and reliable treatment, in Reports of the Howard Association—sent in sealed letter envelopes, free of charge. Address Dr. J. SKILLIN HOUGHTON, Howard Association, No. 2 South Ninth street, Philadelphia, Pa. 26 4*

MECHANICS WANTED—GUN-MAKERS, MACHINISTS, Tool-smiths and Moulders may find constant employment, by applying to or addressing A. RHULMAN, Armorer, Trenton Arms Co., Trenton, N. J. 19 2*

BUREAU OF ORDNANCE.

NAVY DEPARTMENT,
Washington City, April 1, 1863.

This Bureau is desirous of ascertaining whether rifled cannon can be made of wrought iron of sufficient and uniform endurance and economy to warrant their being preferred to guns of cast iron only, or of cast iron strengthened with wrought iron.

Proposals will therefore be received from any manufacturers of forged iron, to furnish a finished gun, or a block of metal from which one may be finished.

The said gun, when finished, to weigh about 10,000 pounds, to be made into a gun throwing a projectile of 100 pounds, as used in cast iron rifled cannon of like weight, to be fired 1,000 times with service charges of the same weight and kind of powder as used in the Parrott 100-pounder, viz: 10 pounds of No. 7, without bursting or wearing in such a manner as to cause apprehensions of bursting.

The quality of metal, price, and other terms, are to be stated clearly in the proposals forwarded.

The Bureau reserves the right to itself of accepting or rejecting any of the proposals.

The time for receiving the proposals is limited to sixty days from date; and proposals will only be received from persons actually engaged in the fabrication of wrought iron.

JOHN A. DAHLGREN, Chief of Bureau.
15 8

MARRIAGE OF THE PRINCE OF WALES AND Princess Alexandra, with Portrait and Likenesses of Parents of the Bride; Dresses, Ceremony, Poem of Welcome, Personal Appearance of the Happy Couple; Man-Monkeys—their Modes of Life, Marriage Customs, &c.; a Poem, by Whittier; Crinoline—protest by a lady; Your Likeness; A Pug Nose, &c., in the MAY number of the PHRENOLOGICAL JOURNAL. Only 10 cents, or $1 a year. Newsmen have it. FOWLER & WELLS, Broadway, New York. 1

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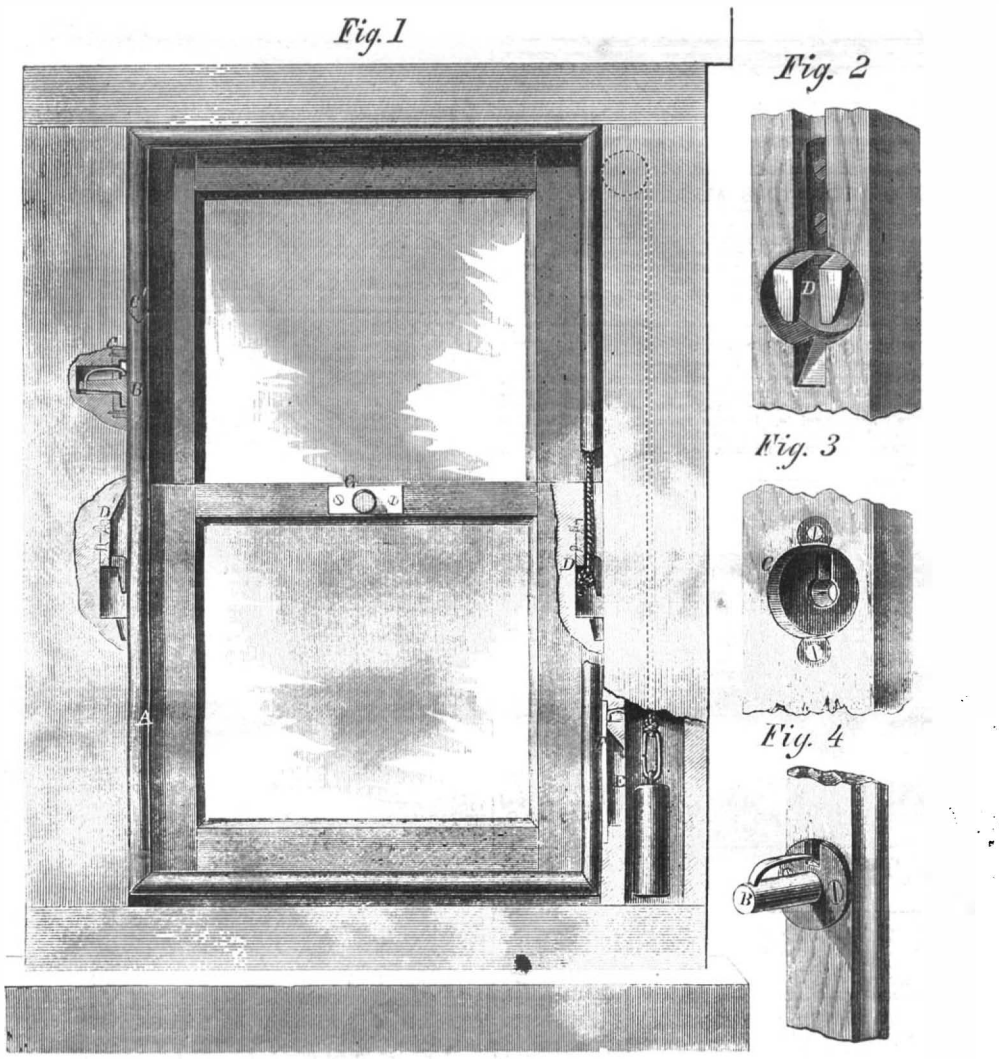
Improved Window Fixtures.

Perhaps no inconvenience is more universally experienced than that arising from defective window fastenings or an unnecessary complication and rigidity of the several parts which prevent them from being easily detached as required. Nearly all persons have had sufficient experience as housekeepers to recall the trouble which they have had when attempting to remove the sashes for the purpose of cleaning them or having them painted, or to re-adjust the cords which hold the weights. In the old-fashioned arrangement of the window-frame, the molding which secures the sash in place is attached to the frame by nails, and these must be drawn out and driven in each time that the sash is removed. The consequence of this proceeding is that the appearance of the wood-work is much injured, and that after a few removals the nail-holes become so enlarged that they no longer perform their office. This is a nuisance that requires attention, and it has received a due degree of it. Our engraving is an illustration of the improved window-frame; in fact, there are several novelties which we shall proceed to describe. Fig. 1, is an elevation of the window with part of the wood-work removed so as to show the connection between it and the fixtures. The side molding, A, which has to be removed before the sash can be taken out, has a small spring bolt let into it at B. This bolt has a keyhole-shaped metallic socket, C, let into the wood-work around the sash. Shown also in Fig. 3. The beveled edge of the upper end, C', of the side molding, is inserted in its place and the bolt slipped into its socket; at the bottom of the molding there is a stout rib or tongue which fits into a groove in the casement of the window, this secures the molding against lateral motion and the sash slides up and down freely in its place. The inner baton separating the two sashes can also be removed in the same way and the upper sash taken out. Fig. 2, is a representation of the cord-attachment, and the position of it on the sash is shown at D; at D', may be seen a similar fixture to which the cord is secured when the sashes are taken out to be cleaned. At the bottom of the casement we shall see a portion of the wood-work removed, disclosing the balance weight and the provision made for securing the cord to it when frayed or broken by use. The passage, E, communicates with the groove in which the sash slides, and when the latter is removed, the small brass plate, F, can be withdrawn, the end of the sash cord drawn out and tied to the link on the weight and the latter hooked in its place, thus saving a great deal of trouble and labor. The sashes are fastened together in the center by the screw, G; a small spiral spring serves to keep the bolt out of contact with its nut when the sashes are raised. The advantages claimed for these arrangements aret hat all parts are rendered easy of access instantly, and that they are particularly useful when about to be cleaned or painted; the fixtures are durable and strong. The sashes will not rattle or vibrate in their cases, and all annoyances arising from this source are avoided. This invention was patented on June 10, 1862, by F. G. Ford (and assigned to T. G. Ford), through the Scientific American Patent Agency; for further information address the inventor, at 173 Bleecker street, New York.



FORD'S PATENT WINDOW FIXTURES.

Renewal of the Charleston Siege.—The attack on Charleston by the *Monitors* is evidently not abandoned. A heavy cargo of war materials for the fleet left New York on Friday, the 1st inst., and with it two of the machines called "devils," which are carried in front of the *Monitors* to remove piles and torpedoes from obstructed waters. There are now three of those customers at Port Royal, and the sending of them affords a strong presumption that the iron-clads are to try another experiment upon the Charleston batteries. It was expected that the iron-clad frigate *New Ironsides* would cross the bar in the Charleston harbor on the 2d inst.

The Cambria Iron Company (Pittsburgh) have just turned out of their foundry the rim of the fly-wheel for their new rolling mill. It is cast in one piece and is twenty feet in diameter and weighs twenty-three tuns! Larger castings of this character are seldom made. The engine for which this wheel is intended is on the ground, and being rapidly put into place. From the size of the fly-wheel some idea can be formed of the power of the engine.

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